PEST CONTROL

APRIL 1954

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Look harmless? These house-fly pupae (magnified several times) develop into the adult chemically-resistant pest that's causing so much trouble to pest control men all over the country. (Photo courtesy of the Orlando laboratory of the Agricultural Research Service, U. S. Department of Agriculture.

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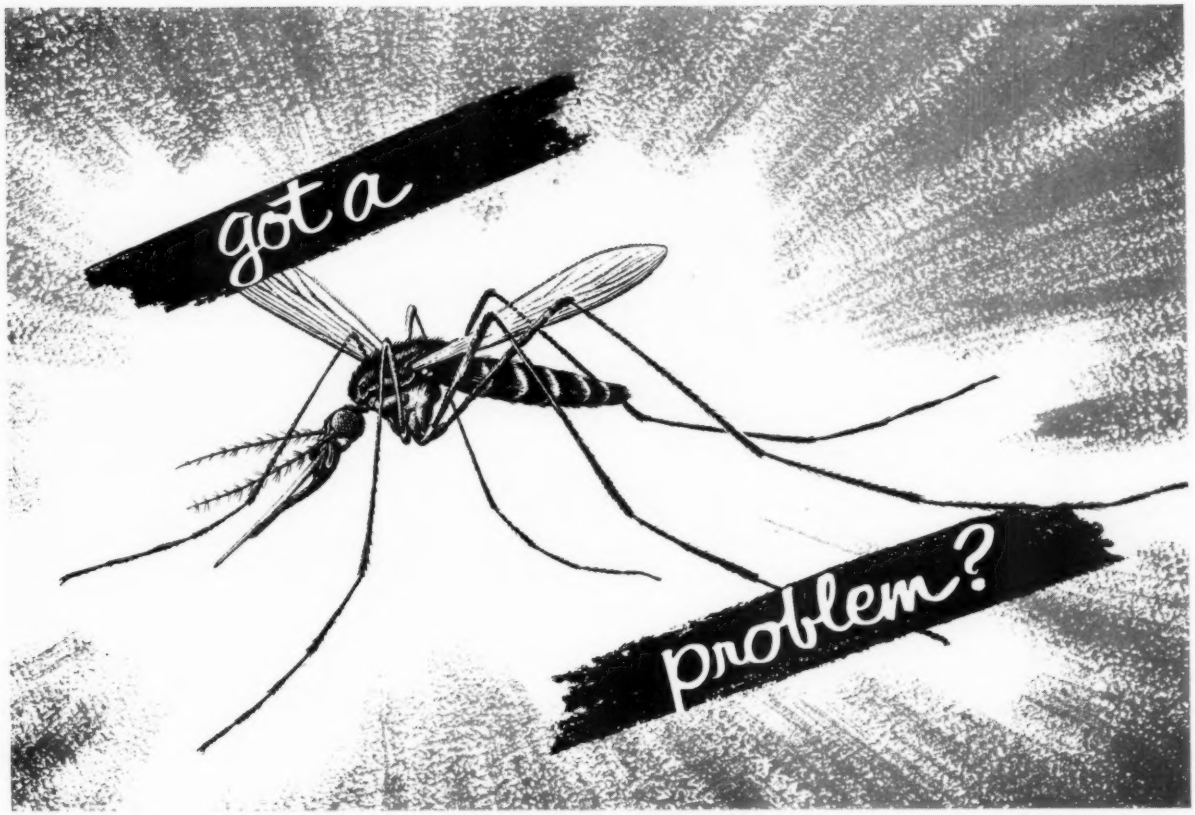

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Like most businessmen you know a first-rate public relations and sales promotion practice is the presentation of talks on pest control before service clubs, church organizations, and meetings of community officials. But maybe you pass up this technique because your knees knock together when you stand before an audience. Or maybe, after you've carefully planned a "terrific" speech, your mind goes completely blank when you start to talk.

There is an easy way to cash-in on these speaking invitations without making your stomach turn somersaults fifty-million times in the process. Show films!

Too few pest control operators take advantage of the professional sound motion pictures, many in color, on flies, mosquitoes and rats available to them on a loan basis, free of charge, from the Communicable Disease Center. On page 50 of this issue is a list of such films on fly control. I have seen a few and can recommend them as excellent sales boosters and servicemen educators. They include unusual close-ups in sparkling, clear photography, plus plenty of sound advice on how to obtain control through sanitation and the application of chemicals by trained personnel.

A couple of years ago I visited the CDC film laboratory in Atlanta and saw first-hand its facilities for making these films. Some of the country's top-notch scientific film specialists work there with professional equipment in a fine studio.

This valuable service is supported by your tax dollars. Why not take advantage of it? Arrangements can be made through either your local health department, the regional CDC office nearest you, or directly with the Communicable Disease Center, 50 Seventh St. N.E., Atlanta 5, Georgia.

After you've shown one or more of these films to a group, it's as easy as taking an order over the phone to add a few pertinent comments and answer questions. You will make a favorable impression and build your reputation as a professional PCO.

All you need is a good sound projector, which can be rented or borrowed if you don't have one, and an experienced operator. Then you're all set to capitalize on these splendid films. Investigate the possibilities. Plan to use CDC films in your sales and training programs this year. It'll pay off.

James A. Nelson

Editor

PEST CONTROL

EVERY MONTH SINCE 1933

JAMES A. NELSON
Editor

R. J. HOFFER
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West Coast Representative

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letters

Claims Fog Machines Give Residual Control

It was with a great deal of interest that I re-read the article "Do Fog Machines Give Residual Control?" by Professor John Osmun in your September 1952 issue.

Professor Osmun's results of no residual control with relatively small particle size were to be expected. I feel that the inference that none of these machines can be used to obtain effective residual action out of doors is misleading. Aerosol machines, of course, would not be the best type for applying residual deposit, but for the pest control operator who wants to use it for an occasional residual application, these machines can be so used.

The two factors that must be considered to get residual deposit are a large enough particle size to settle out in the distance required and enough nonvolatile liquid in the formulation to maintain this particle size.

For a swath width of 100 feet, which is mostly used for residual applications, we recommend a particle size of 40 to 92 microns diameter for wind speeds of 1 to 5 m.p.h. To maintain the particle size until it settles out, we use a formulation containing about one-fourth heavy motor oil. One of the formulas that we used in 1952 for residual action in a woody area consisted of a mixture of 1 pound of DDT dissolved in 1/3 gallon of xylene and then ½ gallon kerosene and 0.1 gallon SAE 50 motor oil added. Only about 25% of the formulation released can be expected to be deposited in the first swath of 100 feet so that enough additional material must be released to compensate for this. In fly control this would call for the release of about 1 gallon containing 1 pound of DDT per 100 feet of travel. Other insecticides require similar outputs. The Dyna-Fog machine requires a large proportion of nonvolatile material as well as large output to produce the large particles necessary for residual deposit. The other well known aerosol machines easily produce these large particles so that the results as given under the general title of fog machines by Professor Osmun might be misleading.

A. H. Yeomans

Technologist
U. S. Department of Agriculture
Bureau of Entomology and Plant Quarantine
Beltsville, Maryland

Dr. Yeomans reports that he has compiled a pamphlet entitled "Directions for Applying Windborne Aerosols for Insect Control Out of Doors." It is available by writing the Beltsville, Md., laboratory.

Attacks Free Inspections

When I received the February issue of *Pest Control* magazine, I opened it and started to read the index and the editorial. I have gotten no farther than the editorial and felt that I must write you. God bless your attack on free inspections.

In Oklahoma we have been on this attack the last three years and have gotten many members of the OPCA to charge for the type of inspections you attack.

Your editorial is not strong enough, though. Why should the home owner himself (let alone a real estate broker) expect three or four free inspections and call in three or four operators to inspect his property? We have been attacking this in Oklahoma and have two or three operators, of which I am one, who charge the home owner $5 whether or not he has termites. The $5 inspection is charged and payable if I make a try for the job, and refused if I don't want the job, and many I don't want. If I get the job I tell them the $5 is covered in the contract price. This inspection fee, while not enough to cover the full cost, does stop the "looker" and the cheap-price seekers. It has helped my termite business.

J. Earl Griffin

Aggie Chemical Company
P. O. Box 176
Tulsa, Oklahoma

ARPs Not Followed Eastern Operator Says

I have been a subscriber to *Pest Control* and its predecessor the *Exterminator's Log* since their inception. During these 20 years, I have found these publications a necessary part of our busi-

(Continued on page 42)

New insecticide kills DDT-resistant flies!

–it's Cyanamid's new organic insecticide

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Easy to handle and apply

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Kills flies in larva or maggot form, too

Now you can kill flies which have become resistant to DDT and other chlorinated hydrocarbons. These stubborn, "resistant" flies are controlled easily and economically by malathion.

A development of American Cyanamid research, malathion has been used with outstanding success throughout the country. Easy to apply as a straight or bait spray, one application of malathion will last as long as three weeks, depending on original infestation, general sanitation and weather.

For fast, effective fly control, thoroughly wet the surfaces where flies breed or congregate. Follow the manufacturer's instructions and precautions.

American Cyanamid Company manufactures only technical malathion. It is formulated by well-known manufacturers and sold under their own brand names.

For further information consult your supplier or write to us for fly control chart.

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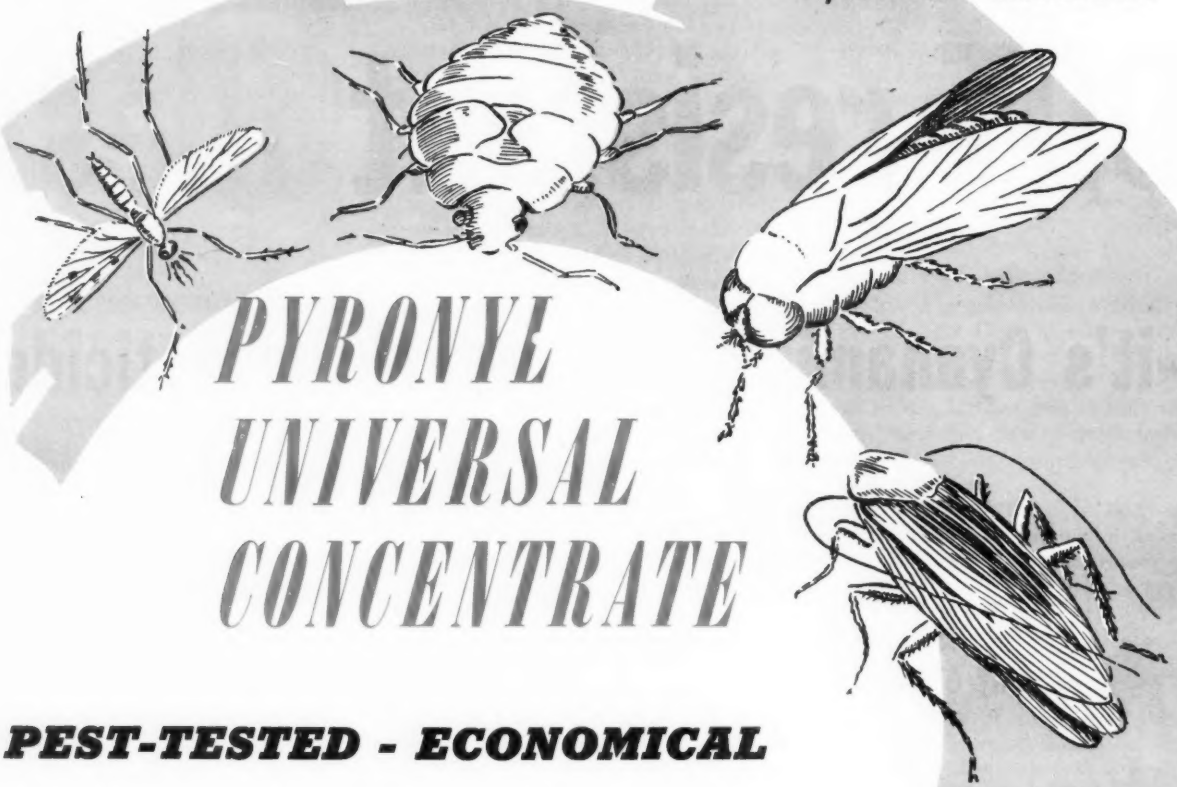

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Fly Control In 1954:

Another Rough Season?

NO WIDE-SWEEPING recommendations that'll dish-up complete fly control on a silver platter can be applied to the 1954 fly season. It's going to be a rough one, full of trial-and-error techniques for pest control operators who do not want to disappoint customers looking to them for relief. That's the opinion of experts everywhere who suggest PCOs will have to depend upon their own experiences to eliminate chemicals that no longer work. DDT-resistant flies, although generally present, are not to be found everywhere. If you're in that Shangri-La where DDT still gives fly control, you have no problems.

What works for a PCO in Wisconsin may be just an exhilarating highball for flies in Florida, or vice-versa. Some of the new fly killers look good in tests made across the country. A thorough review of results from last year's fly season was published last month by the Communicable Disease Center in *Pest Control*, pages 12-13. Every PCO who has 1954 fly control contracts should read this valuable report. A few anticipated successes with chemicals not registered in '53 are suggested by the CDC.

Latest Word

Latest word from the National Pest Control Association just two weeks ago is that Malathion and Diazinon will probably be the newest additions to the growing line of chemicals now being offered for fly control.

There's a good chance Geigy's Diazinon will be registered in time for use by PCOs this summer. A 1% strength of actual Diazinon is what will probably be recommended. That's 32 pounds of 25% wettable powder in 100 gallons of water. But it must be used with extreme care. Labeling restrictions will be like those for parathion. Diazinon cannot be used inside dairy barns, nor inside inhabited dwellings, and its application is forbidden wherever food is processed or stored.

Malathion, which the U. S. Department of Agriculture said was one of the safest insecticides to handle, is being recommended at a strength of 2.5%. Addition of sugar seems to step up effectiveness of this chemical. Malathion is registered and available now.

That's about all that's really new.

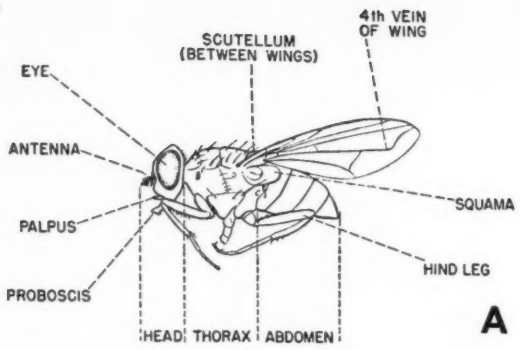
A successful emulsion combination of Dilan, DDT and cotton seed oil gave eight weeks' effective control against DDT-resistant house flies. Commercial Solvents Corporation has not yet applied for registration of Dilan for household use, so this formulation appears to be out in 1954.

Lindane, Chlordane, Dieldrin, DDT, Methoxychlor, Pyrethrum with or without synergists, to name but some effective fly control chemicals, still produce satisfactory results for many operators.

It's elementary to repeat sanitation and screening head the list when it comes to expecting any kind of fly elimination. In cities, garbage is the number one source of fly populations. Dog feces rank next. If it's not possible to get rid of these breeding spots, cover them up. On farms, moist high-protein stock food, temporary manure piles, and cattle urine pits in earthen floors, are the biggest causes for fly trouble. Around restaurants, see to it there's proper garbage disposal, that waste water containing food particles and smells is not permitted to drain into soil, but rather be properly tiled into the sewage system. Scrapings and grease around stoves, as well as sludge accumulations in corners and in the pits of dumb waiters, unclean linen, etc., have to be eliminated in public eating places. Getting rid of the attracting odor, wherever it may come from, has to be one of the objectives in your sanitation program.

Pest Control will keep its readers informed of new chemicals and application techniques for better fly control as they are developed. At this time, there is nothing more new on the subject. It looks as though, for many, 1954 is going to be another rough fly season!

Fly Identification is *Easy* with CDC Pictorial Keys



By DR. HAROLD R. DODGE

BECAUSE IDENTIFICATION of common varieties of flies is often necessary before treatment can be prescribed, the Communicable Disease Center of the Public Health Service has prepared two pictorial keys to help operators obtain adequate fly control.

One, the "Pictorial Key to Common Domestic Flies in the U. S.," separates 21 species of flies that PCOs might encounter. The other, "Pictorial Key to Principal Families of Diptera of Public Health Importance," lists 24 families of Diptera with special emphasis on common types of flies.

Here is basic information on fly classification and use of the pictorial key especially prepared to aid those active in pest control work.

• How Flies Are Classified

In scientific practice, each kind of organism is given two names. For example, the common housefly is called *Musca domestica*. *Musca* is the generic name and *domestica* the specific name. Generic names are always capitalized; specific names are not; both are italicized. Sometimes, when the generic name is mentioned previously, it is abbreviated to the first letter followed by a period, for example, *M. domestica*. In the accompanying pictorial key, some of the generic names are followed by "spp." An example is *Sarcophaga* spp. This means that more than one species occurs within the genus *Sarcophaga* but that the key does not separate the species. Often the name or an abbreviation of the name of the person who described the species is given after the specific name. For example, the name of the common housefly may be followed by the name Linnaeus, sometimes abbreviated Linn. or L.

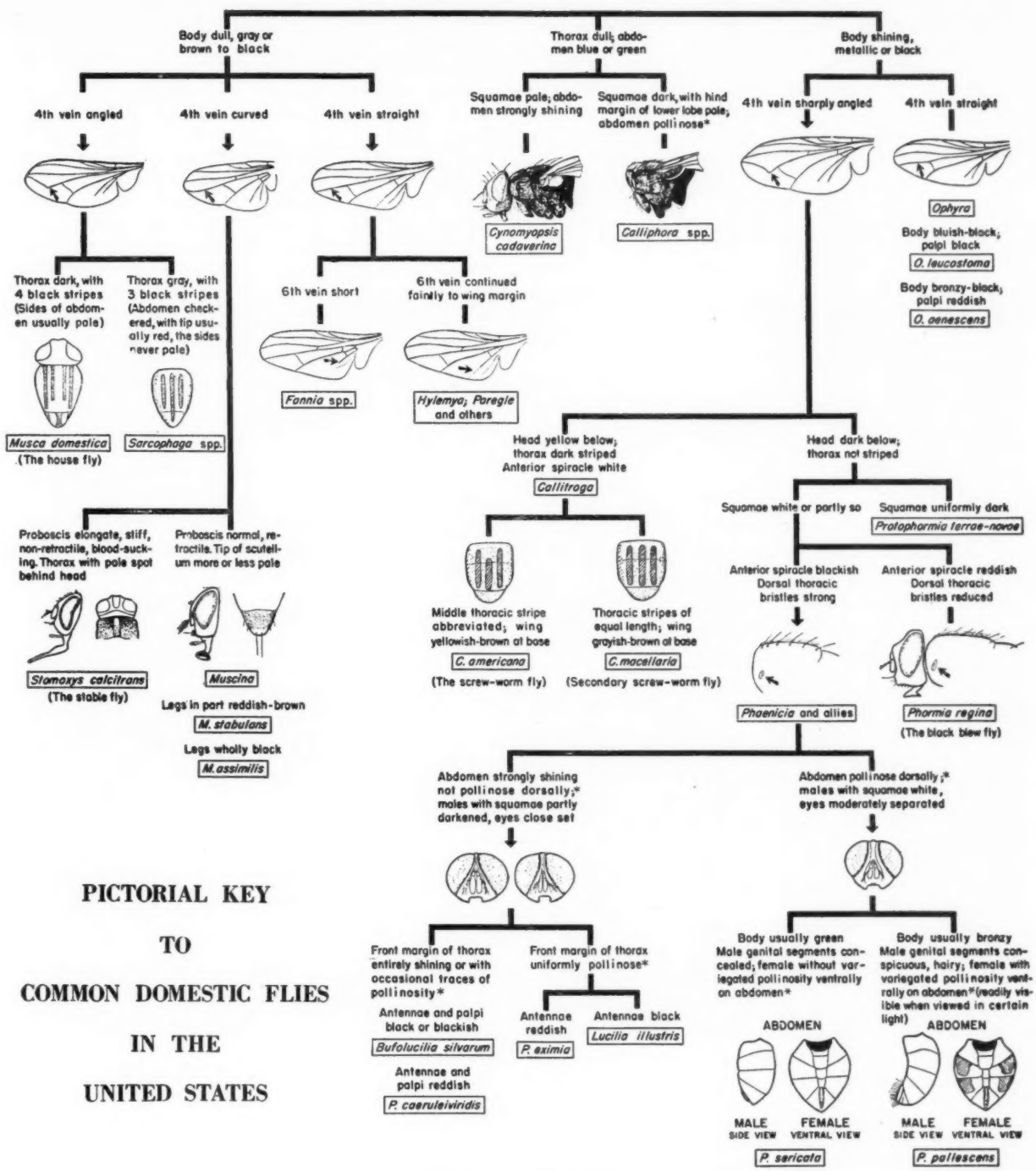
A family constitutes a group of related genera. For example, the family "Muscidae" includes *Musca*, *Muscina*, *Ophyra*, *Stomoxys*, and related genera. Sometimes unrelated genera superficially resemble each other closely. On the other hand, members within one family may be quite diverse in general appearance. Thus, it is much simpler to recognize the housefly than to recognize its family characteristics. In fly control operations, the family name of a fly is of secondary importance; therefore, only the material in the "Pictorial Key to Common Domestic Flies in the U. S." is presented here.

• Use of the Key

Identification keys are merely guides used to distinguish between closely related species. The most common type of key consists of a series of choices or "couplets," each containing two or more alternatives; each alternative refers the user to a succeeding couplet until the specimen under consideration is keyed or "run out" to a certain identity or name. In pictorial keys, most or all of the characteristics used in the couplets are illustrated.

In using the pictorial key shown, the general coloration of the body must first be determined. The housefly, for example, belongs in the gray-bodied group at the left. Three subdivisions of this group are based on the structure of the fourth wing vein. It can be observed even by the naked eye that this vein, which in many species ends behind the wing tip, is abruptly angled (not gradually curved) and ends before the wing tip, close to the end of the third wing vein. The presence of four dark stripes on the thorax and the usual yellowish coloration of the abdomen sets it apart from the various species of *Sarcophaga*.

Much of the entomological literature on fly identification is difficult and expensive to obtain. However, the various species of domestic flies in the United States have distinguishing characteristics that workers who lack professional entomological training may learn to recognize. This article is especially designed for the information of operators engaged in fly control operations where large numbers of specimens are involved. Some remarks in zoological terminology and the use of keys are included to aid those not experienced in insect identification. Copies of the two keys on fly identification mentioned in the article and the other available pictorial keys may be obtained by writing the Officer in Charge of the Communicable Disease Center, Public Health Service, Atlanta, Ga.


Body dull, gray or brown to black
Thorax dull; abdomen blue or green
Body shining, metallic or black
4th vein angled
4th vein curved
4th vein straight
Squamae pale; abdomen strongly shining
Squamae dark, with hind margin of lower lobe pale; abdomen pollinose*
4th vein sharply angled
4th vein straight
Cynomyopsis cadaverina
Calliphora spp.
Ophyra
Body bluish-black; palpi black
O. leucostoma
Body bronzy-black; palpi reddish
O. aenescens
Thorax dark, with 4 black stripes (Sides of abdomen usually pale)
Thorax gray, with 3 black stripes (Abdomen checkered, with tip usually red, the sides never pale)
6th vein short
6th vein continued faintly to wing margin
Musca domestica
(The house fly)
Sarcophaga spp.
Fannia spp.
Hylemya; Paregle and others
Head yellow below; thorax dark striped Anterior spiracle white
Callitroga
Head dark below; thorax not striped
Squamae white or partly so
Squamae uniformly dark
Protophormia terrae-novae
Proboscis elongate, stiff, non-retractile, blood-sucking. Thorax with pale spot behind head
Proboscis normal, retractile. Tip of scutellum more or less pale
Middle thoracic stripe abbreviated; wing yellowish-brown at base
C. americana
(The screw-worm fly)
Thoracic stripes of equal length; wing grayish-brown at base
C. macellaria
(Secondary screw-worm fly)
Anterior spiracle blackish Dorsal thoracic bristles strong
Anterior spiracle reddish Dorsal thoracic bristles reduced
Stomoxys calcitrans
(The stable fly)
Muscina
Legs in part reddish-brown
M. stabulans
Legs wholly black
M. assimilis
Phaenicia and allies
Phormia regina
(The black blow fly)
Abdomen strongly shining not pollinose dorsally;* males with squamae partly darkened, eyes close set
Abdomen pollinose dorsally;* males with squamae white, eyes moderately separated
Front margin of thorax entirely shining or with occasional traces of pollinosity*
Front margin of thorax uniformly pollinose*
Antennae and palpi black or blackish
Bufolucilia silvarum
Antennae and palpi reddish
P. caeruleiviridis
Antennae reddish
P. eximia
Antennae black
Lucilia illustris
Body usually green Male genital segments concealed; female without variegated pollinosity ventrally on abdomen*
Body usually bronzy Male genital segments conspicuous, hairy; female with variegated pollinosity ventrally on abdomen* (readily visible when viewed in certain light)
ABDOMEN
ABDOMEN
MALE SIDE VIEW
FEMALE VENTRAL VIEW
MALE SIDE VIEW
FEMALE VENTRAL VIEW
P. sericata
P. pallescens

PICTORIAL KEY TO COMMON DOMESTIC FLIES IN THE UNITED STATES

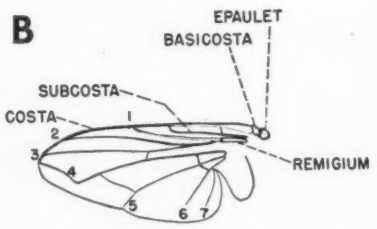
*"Pollinose" refers to a whitish dusting of a surface caused by microscopic hairs.

Identifying another common fly, *Phaenicia sericata*, is not as simple. The uniformly greenish-colored body refers it to the group of species on the right side of the key. It will not be difficult to observe that the fourth vein is again abruptly angled or that the thorax is without obvious dark stripes, so it readily keys past *Ophyra* and *Callitroga*. But its separation from the remaining genera and species is rather difficult. The whitish squamae (see fig. A of whole fly for location of this structure) and lack of a reddish spot on the side of the thorax (see arrow in key illustration) will put it with "*Phaenicia* and allies." The dorsal pollen of the abdomen gives it a duller color than the very bright, shining abdomen of most species of this group, but if the specimen is of

Reprinted from **Public Health Reports**, March 1953, with permission from the Communicable Disease Center, Atlanta, Ga.

the male sex, in which the pollen is less evident, it is useful to check the color of the squamae and the width of the interocular space (see illustration at this point in the key and fig. C). *Phaenicia sericata* can be separated from the remaining species, *Phaenicia pallescens*, by its usual greenish color and the other characteristics shown in the key.

As familiarity with the various flies increases there will be less



No'S 1-7 ARE THE "LONGITUDINAL WING VEINS" USUALLY REFERRED TO AS "VEINS"

and less need to refer to the key. The observer may even notice that some flies have prominent differences not mentioned in the key. For example, *Phaenicia* and allies are brighter colored than *Phormia* and *Protophormia*. In a key of this type, it is, of course, impossible to give all the outstanding characteristics. Some additional information on the various species follows. But is is advisable during the initial identification work to send representative determined specimens of all species to a specialist for confirmation.

• Features of Common Fly Species

Calliphora spp. and the allied species, *Aldrichina grahami*, a native of Asia now well established in California and Arizona, and *Eucalliphora lilaea*, a common western species that is rare in the East, are quite easily recognized by the narrow, crescent-shaped, white margin of the lower squamal lobe. The identification of most species in this group is difficult, but two common species can be recognized as follows: *Calliphora vicina* (formerly called *erythrocephala*) has cheeks which are mainly reddish, and it has a reddish anterior thoracic spiracle; *Calliphora vomitoria* has a "beard" of reddish-yellow hairs on the lower hind margin of the head. The species of the *Calliphora* complex are common in the Northern Hemisphere in the spring and fall. In the southern states they occur chiefly in the winter months. They breed primarily in dead animal matter.

Callitroga americana and *Callitroga macellaria* range from Argentina to northern United States. They are very similar in general appearance but differ in habits. *C. macellaria* is a common fly over the greater portion of its range. It is readily attracted to traps and breeds in dead animal matter. *C. americana*, the "screw-worm" fly, is a primary parasite of mammals; its larvae occur in wounds and natural body orifices. Generally, it is larger in size than *C. macellaria* and the legs are usually nearly black. *Paralucilia wheeleri* is a western species which strongly resembles the two species of *Callitroga*, but it is distinguished from them by its dark brown squamae and longer palpi.

Cynomyopsis cadaverina is a common northern species allied to *Calliphora* and similar to that genus in habits and seasonal distribution. It is easily recognized through the nearly uniform white squamae which contrast sharply with the dark body, and by the more strongly shining abdomen which in both sexes is more pointed.

Fannia spp. are moderately small, grayish or brownish flies, sometimes marked with yellow. Certain species are black and shining, but they never approach the highly polished black of *Ophyra*. *Fannia canicularis* is commonly known as the "little housefly" and *Fannia scalaris* as the "latrine fly." The sixth wing vein of *Fannia* is short and the seventh is sufficiently curved so that the two would, if continued, intersect before they reach the wing margin. *F. canicularis* and *F. scalaris* are nearly cosmopolitan in distribution, breeding in moist material of plant or animal origin.

Hylemya cilicrura and *Paregle cinerella* are two common examples of the Anthomyiinae, a subfamily characterized by the continuation of the sixth vein, though faintly, to the wing margin, and by the presence of fine, erect hairs subapically on the under side of the scutellum. In *H. cilicrura* the female has a characteristic reddish spot above the base of the antennae, and in the male the abdomen, viewed laterally, is quite flat. In *P. cinerella* the head usually is entirely black, and the male abdomen is not greatly flattened. Both species breed in vegetable matter, and they and allied species are sometimes important pests of crops. They are widely distributed in the United States.

M. domestica, the "housefly," is easily recognized by the characteristics mentioned in the key, and there are few other American flies which might be confused with it. These are, primarily, *F. canicularis*, *Stomoxys calcitrans*, and *Muscina*. In other parts of the world there are many species of the genus *Musca*. *M. domestica* breeds in garbage, vegetable matter, or excrement of herbivorous animals, and is widely distributed throughout the world.

Muscina stabulans, the "false stablefly" and *Muscina assimilis* are widely distributed species, both probably originating in the Old World. They are well-marked species, somewhat larger than the housefly, and have a moderately curved fourth vein. They breed primarily in plant and animal wastes where their larvae may

USUAL DIFFERENCE IN INTEROCULAR SPACE OF MALE AND FEMALE FLIES

ANTERIOR VIEW **C**

prey upon other fly larvae. Two allied, larger species are relatively new to North America, *Muscina pascuorum* and *Muscina pabulorum*. They are distinguished from *M. assimilis*, which they otherwise resemble, by their larger size, the reddish palpi (not black), and by the strongly curved fourth vein, ending in or before the wing tip.

Ophyra aenescens and *Ophyra leucostoma* are easily recognized by the highly polished, shining black body. *O. aenescens* is

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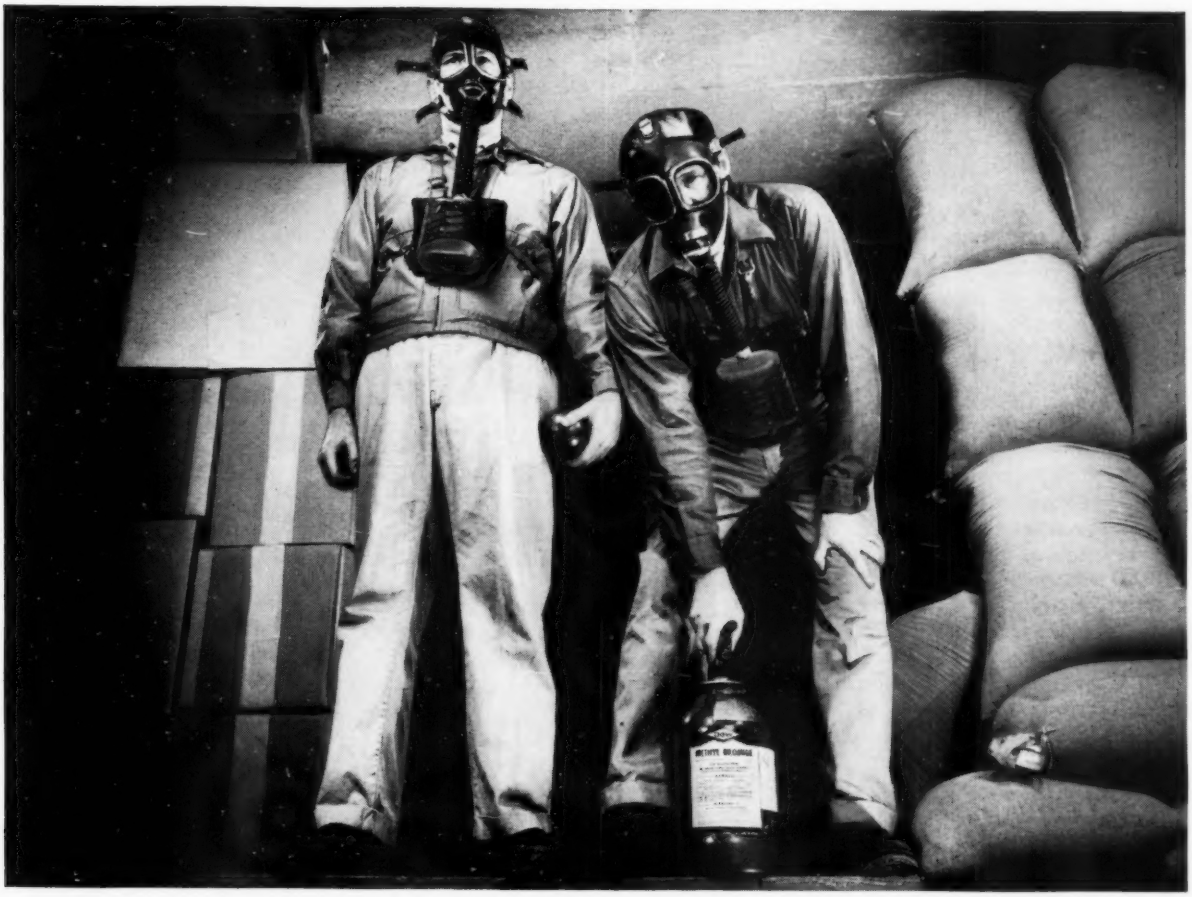

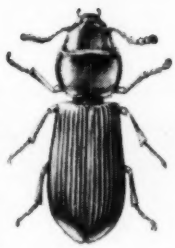

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bronzy-black with yellowish squamae, while *O. leucostoma* is bluish black with dark squamae. The difference in body color between these two species, though slight, is remarkably constant. Both species are widely distributed in the United States; they apparently prefer to breed in animal matter.

Phaenicia and the related species, *Lucilia illustris* and *Bufolucilia silvarum*, are quite difficult for the beginner to separate. *Phaenicia sericata*, the most common species, is variable in body color, ranging from its usual green to bluish, and occasional specimens have a reddish, "coppery" luster. Together with its closest ally, *Phaenicia pallescens*, it may be distinguished from the remaining species by a whitish pollinosity on the upper surface of the abdomen, especially in the females, and by the separation of the male eyes by a distance equal to or greater than one-tenth the width of the head. *P. pallescens* is a smaller species with body usually bronzy colored, sometimes with greenish luster but never coppery red. It is common in the southern states and is a close relative of *Phaenicia cuprina*, an important pest in Australia and Africa. Both *P. sericata* and *P. pallescens* are primarily urban species, being common in market districts and city dumps.

Phaenicia caeruleiviridis, *Phaenicia eximia*, *Lucilia illustris*, and *Bufolucilia silvarum* agree in that the abdomen is highly shining dorsally, and the eyes of the male are separated by a distance less than one-tenth the width of the head. These species all breed in dead animal matter, except possibly *Bufolucilia*, which is known to be a parasite of frogs and toads. *P. caeruleiviridis* and *P. eximia*, in contrast to *P. sericata* and *P. pallescens*, are mainly rural in their habits, seldom being encountered in city business districts or city dumps. However, they frequently may be taken in residential areas. *P. caeruleiviridis* is widespread east of the Rocky Mountains; *P. eximia* is a neotropical species which occurs in Texas and Louisiana; *L. illustris* and *B. silvarum* are widely distributed in the northern and western states.

Phormia regina and *Protophormia terraenovae* should be recognized without difficulty through their key characteristics. Both species breed in animal matter and occur primarily during the cooler months of spring and fall, or, in the southern limits of their range, in the winter. *P. regina* is deceptively called the "black blowfly," for its body is not black. Both species are of darker coloration than the various species of the *Phaenicia* complex. *P. regina* is usually dark green; *P. terraenovae* is usually dark blue. Both species are widespread in the Northern Hemisphere. *P. regina* is the more common species, being absent or rare only in the south-

Here at his desk is Glen Burnett—

Getz In Atlanta

No one could speak more highly of a branch operation manager than did Getz Exterminator's late president, **Thom-C. Raley** of his Atlanta, Ga. man, **Glen Burnett.** Home office of the company is in St. Louis.

Don't know whether it was a natural interest in entomology that attracted Glen to pest control, or Mr. Raley's pretty niece who became Mrs. Burnett. Whatever the reason, Burnett started working for "Uncle Tom" in St. Louis during summer vacations from high school in 1924. After graduating, he put two full years in St. Louis, then took a route covering Illinois and Iowa. In Atlanta since 1930, Burnett has servicemen working accounts in North and South Carolina, Alabama, Mississippi, the Gulf coast of Florida and Georgia.

Never an advocate of residuals for inside work, GB uses sodium fluoride for resistant roaches and says brown-banded roaches seem to be becoming more prevalent in hotel rooms, indicating they may be getting resistant, too.

Recently, Getz headquarters in Atlanta moved its offices, laboratory and warehouse from the old location at 92 Plaza Way, S. W., to new and larger quarters at 600 North Highland Ave., N. E.

Getz Exterminating Company's new Atlanta location.

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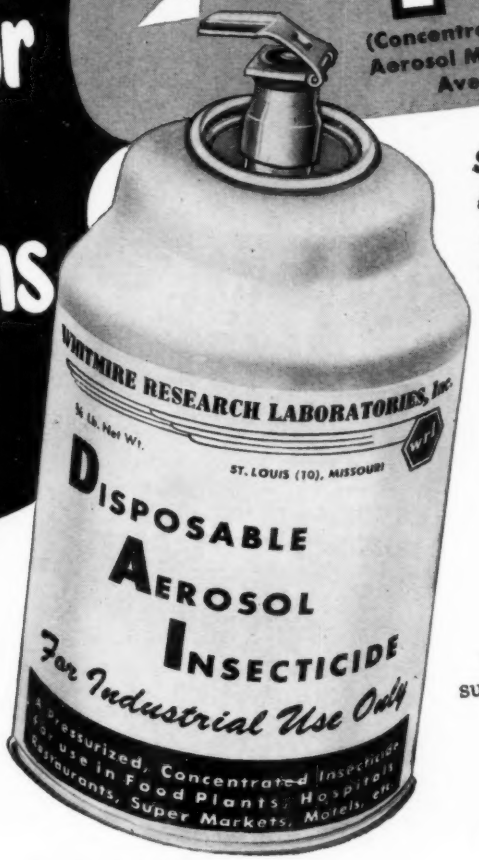

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1 Bomb —¾ lb. net	$ 2.40
6 Bombs—Carton of 6, 4½ lbs. net	12.50
12 Bombs—2 cartons, 9 lbs. net	24.00

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ernmost parts of the United States.

Sarcophaga spp. includes a large group of genera and species of the family Sarcophagidae. These flies vary from three-sixteenths to more than 1 inch in length, and with few exceptions have three dark stripes dorsally on a grayish thorax. Some tropical species are bright yellow with black markings, or even metallic blue or green. The abdomen typically has a "checkered" pollinose pattern of changeable light and dark areas, with genital segments usually reddish but sometimes black. Female sarcophagids deposit living young.

Stomoxys calcitrans, variously called the "stablefly," or "dogfly," or "biting housefly," is a common and very widespread pest of livestock and will bite man freely. It breeds in excrement of herbivores, or in accumulations of vegetable wastes such as piles of grass clippings or seaweed. The elongated, stiff proboscis is characteristic of this species. In repose it projects for a considerable distance in front of the head. In size and general coloration, *Stomoxys* resembles the housefly but is further distinguished from that species by the moderately bent fourth wing vein and by the whitish pollinose spot on the front margin of the thorax.

Two other genera not represented in the key rate mention. *Pollenia rudis* frequently enters houses or attics in large numbers in the fall; for this reason it is called the "clusterfly." Although it keys to *Musca* and *Sarcophaga*, it differs from these flies in having a thorax that is not striped but is partly clothed with crinkly yellowish hairs, particularly on the sides. The larvae of this species are parasitic on earthworms.

Scopeuma spp. are dung breeding flies which occasionally are common, and which are characterized by dense yellowish hairs and by the slender body. They would key out with *Hylemya*. They occur during the cool months of the year from the Arctic to the southern states.

At times certain other species of flies may appear to be common. It is impossible with limited space to deal with all species which may be encountered, but the species considered here constitute the bulk of the flies commonly associated with man in North America.

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Flies . . . Are They Dangerous As Polio Carriers?

Flies can transmit polio but there is no evidence to indicate they are important as bearers of the disease.

That's the latest word from Roy F. Fritz, senior scientist, epidemiology branch at the Communicable Disease Center on flies as carriers of poliomyelitis virus.

Scientists still lack information on this vital question. Efforts to lessen polio epidemics by intensive fly control have given little promise or success, or have neither proved nor disproved if flies are significant in spreading polio, the CDC says.

The Public Health Service does not suggest *emergency* fly control activities during polio epidemics because they might give the public a sense of false security and other control methods may be overlooked. However, PCOs are encouraged to dig-in to fly abatement projects done on a rational and continuing basis.

Researchers studying fly transmission of poliomyelitis have come up with the following facts: (1) Polio virus can be found in the stools of infected persons and in sewage containing such stools; (2) The virus has been isolated from blow-flies and house-flies during epidemics; and (3) Experimental animals have been infected by eating materials containing poliomyelitis virus. In one instance flies in the home of a polio case became contaminated with the disease virus and conveyed enough of it to food which had no other contact with the virus, so that poliomyelitis-free chimpanzees developed polio shortly after eating the infected food.

It all boils down to the fact that little definite information is available on the subject. Evidence has shown epidemics of polio have occurred in the absence of flies and that effective fly control has not prevented outbreaks of the disease. The opinion among poliomyelitis workers now is that the disease is transmitted directly from person to person, probably through oral-oral or fecal-oral routes.

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No Market for Mosquito Control?

Don't be too sure!

ALTHOUGH most large-scale mosquito abatement programs are carried out by government agencies there is still a field in small communities and on the fringes of area-wide projects that can be adequately handled by PCOs who investigate, recommend and institute methods of sanitation and control.

• PCO Limitations

PCOs are limited in the type and scope of area-wide mosquito control service they can offer for two major reasons. First, most large-scale mosquito control programs are paid for by taxes and are carried out by state and federal health departments or mosquito abatement districts. Secondly, the extent of these programs often requires the use of heavy construction equipment such as cranes, bulldozers, pumps, etc., and the services of trained engineers. PCOs don't have the equipment, staff, or time to do work of this sort. [1,2]

• Potential Customers

However, small towns and areas where no agencies are available to cope with mosquito problems offer one potential market for operators, as do fringes of area-wide government projects. Large estates, private homes, and business and industrial properties are also excellent prospects.

Resort areas, private picnic sites, drive-in theatres, sports parks, and fairgrounds—in fact everywhere where large groups of people congregate—probably offer the best market for mosquito control. Mosquito reduction projects might also interest summer camp operators and people desiring relief from miscellaneous mosquito nuisance situations.

• Obtain Public Support

Mosquito control programs will seldom be successful unless public cooperation and acceptance is obtained. Inform the public on what's going to be done—how it's going to be accomplished—and why it is necessary. Use the elements of good salesmanship and public relations in putting across the need for such a program.[1]

Civic clubs and organizations are often influential for gaining public support for mosquito control projects. Some groups that have aided operators are the Junior Chamber of Commerce, Kiwanis, Rotary Club, Lions Club, Boy and Girl Scouts, American Legion, VFW, woman's clubs and church organizations.

• Make Survey of Area

As in other types of pest control, the first consideration in a mosquito control program is a survey of the breeding areas — paying particular attention to swamps, ditches, sluggish streams, storm sewer traps, or any other location containing stagnant water.

A well conducted survey is of double value to PCOs. It shows where treatments must be made, and the amount of labor and materials necessary to do the job.

The survey will also reveal the identity of mosquitoes causing the infestation. Understanding life histories, habits, and breeding places of different species aids in control, because mosquitoes are as varied in their habits as human beings, and these variations must be understood and taken into account for adequate mosquito elimination.

Few general statements can be made about mosquitoes. Some species travel only a short distance, while others travel twenty miles or more; some develop in fresh water, others in salt or brackish water; some prefer clear water, others very foul water; some develop in pools and swamps, others in containers such as cans or barrels—some even prefer treeholes for their larval home.[2]

• Four Stages in Development

There are four stages in the development of mosquitoes. First, eggs are laid on the surface of water or in places where water is likely to accumulate. Second, larvae, or "wiggle tails," hatch in these areas in from one to three days. Third, they change into the pupa or "tumbler" stage within seven to ten days. Fourth, they emerge as adult mosquitoes two or three days later.

During summer months the complete life cycle of adult mosquitoes may be as short as eight days. Each female lays from 100 to 400 or more eggs and a number of generations occur during one season.[3]

• 3 Ways to Eliminate Breeding Areas

Operators generally find that eliminating mosquito breeding areas brings most effective results, and prevents further infestation.

Three types of operations are commonly adopted to eliminate breeding places: (1) Ditching stagnant streams, back water pools, and swampy areas is done to insure a continuous flow of water, and to destroy grassy stream banks, which are especially suitable for mosquito breeding; (2) Filling-in abandoned quarries, gravel pits and dumps where drainage is not practical becomes necessary when infestation occurs; and (3) Protecting chance water receptacles, such as barrels, tin cans, old tires, etc., against infestation may be brought about by screening barrels, punching holes in the bottoms of cans, etc. Two of these operations, ditching and filling-

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This article is based on material prepared by Harold F. Gray, engineer-manager, Alameda County Mosquito Abatement District, Oakland, Calif.; John V. Osmun, Professor of Entomology, Purdue University; the late William O. Buettner, past executive secretary of the National Pest Control Association; and the Communicable Disease Center, Public Health Service.

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in, are not practical for the PCO unless done on a small scale.

Sometimes it is impractical or undesirable to drain mosquito breeding places. When this situation occurs, try stocking the infested body of water with fish. Several species of minnows, especially those of the genus Cambusia, have been successfully used in mosquito infested waters. Effectiveness of fish is increased if vegetation and debris along the banks is cleared away to give them easy access to all parts of the water.[3]

• Chemical Controls

DDT is still the best mosquito insecticide for space sprays and residual treatments in areas where resistance is not a factor. (PC, Mar. '54, pp 9-12). Use of 5% DDT emulsion residual sprays in dwellings or a 5% DDT oil solution for outdoor space treatment control of adult mosquitoes is recommended.

However, the Communicable Disease Center warns that exposure of both larval and adult mosquitoes to chlorinated hydrocarbons causes a more rapid development of resistance than does the exposure of a single stage. CDC says that in areas where both larviciding and DDT residual spraying of homes are contemplated, consideration should be given to the possible use of organic phosphorous compounds for larviciding operations.

When larvicidal treatment with DDT is advisable, effective control is possible either by hand spray application of 0.05 pound of DDT in one gallon of fuel oil per acre, or by airplane application at the rate of 0.05 to 0.10 pound of DDT per acre, applied as a 20% solution in methylated naphthalenes such as Velsicol NR-70 or Sovacide 544 B.

Residual larviciding with a DDT emulsion at the rate of 3 pounds per acre (in two gallons of finished spray) gives effective control in breeding areas for from three to six months, reports the CDC. But watch out — this treatment is totally destructive to fish, and should not be used when fish are present in the area.

Dieldrin applied as an emulsion concentrate or as a wettable powder suspension at the rate of one pound per acre will prevent mosquito breeding in small, landlocked bodies of water for more than a year, but its destructive qualities to some forms of aquatic life makes its use inadvisable except in unusual cases.

CDC reports residual larviciding with technical BHC (12% gamma isomer) emulsions at the rate of 1 pound per acre gives satisfactory mosquito control over a five to eight week period.

Fog applications are effective and practical when protection is wanted for limited periods. A Long Island, New York, PCO reports effective control during summer months by fogging once a week for ten weeks. Nighttime control of salt-marsh mosquitoes was obtained at a drive-in theatre in Savannah, Ga., by single fog applications of 2.5% DDT, 1.0% chlordane, or a pyrethrum formulation containing 0.25% pyrethrins and 2.0% piperonyl but-

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"Telvar" W is applied with your regular spraying equipment. It goes into the ground where it kills the roots of weeds and grasses . . . *stays in* the soil to prevent new growth. Industrial plants need this long-term protection around storage areas, stockpiles, pole yards, rail sidings—*anywhere* vegetation is a fire hazard or eyesore.

Your market for weed control with "Telvar" W is big. And you'll find this weed killer easy to handle and apply . . . one spraying of 40 to 60 pounds of "Telvar" W per acre usually gives season-long protection. It's a wettable powder, non-corrosive and non-volatile, safe to use.

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oxide, in a 1:1 fuel oil-kerosene solution.[4]

• Recommended Equipment

Various types of equipment, each for specific purposes, are used in mosquito control operations. Fog machines are recommended for area control of adult mosquitoes, but are of little value for outdoor residual deposits. Mist sprayers have been reported good for residual sprays. Hydraulic sprayers give excellent results when applying insecticides to bodies of water. For small areas, a three-gallon compressed air sprayer may be used by drifting a fine spray over the water. Airplane applications are successful over swamps, lakes or similar areas, but they are not recommended over cities or other populated regions.[3]

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Diro has been kill-tested in Florida, California, and throughout the Midwest. In these and numerous other field and laboratory tests, conducted under extreme as well as typical conditions, sufficient evidence has been accumulated to prove that Diro, when properly applied, is seldom equalled for quick, effective, low-cost control of resistant flies, mosquito larvae, pupae and adults.

Diro contains no chlorinated contact insecticides. Active ingredients 100%. Formulated of Rotenone-Rotenoid[1] solvates, cube resins, citrus oil terpenes, polyethylene glycol mono esters of mixed fatty rosin acids, organic solvents and petroleum distillate.

Produced under the supervision of a pharmaceutical chemist.

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*Registered U. S. Patent Office
[1]Whitmire Patent No. 2 267,395

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Though the individual pest control operator cannot be responsible for maintaining sanitation around garbage storage sites, he can point out actual and potential fly breeding areas and advise on how to eliminate these conditions which stand in the way of a successful fly control program.

Here are suggestions on garbage storage, collection and disposal, compiled by the Public Health Service Communicable Disease Center, Atlanta, Ga.,* that PCOs may pass on to their customers.

In urban areas, inadequate facilities for storage, collection and disposal of garbage usually result in widespread sources of fly breeding. Infestation in garbage can be held to a minimum only when all three of these operations are properly coordinated and executed.

Such things as uncovered garbage cans, bits of waste left in containers after collection, and leakage from cans provide sources for breeding. These conditions can be corrected by keeping lids tightly closed, thoroughly cleaning containers frequently, and clean-up of the area around garbage cans.

In communities where garbage and rubbish are collected separately, covered metal containers of from five to 10 gallon capacity are recommended. Where there are combined collections, 20 gallon covered metal containers are best. In both cases advise customers to wrap waste foods in several folds of paper before placing them in cans — this provides

(Continued on page 62)

* "The Control of Domestic Flies" J. H. Coffey and H. F. Schoof, Public Health Service, Communicable Disease Center, June 1, 1949.

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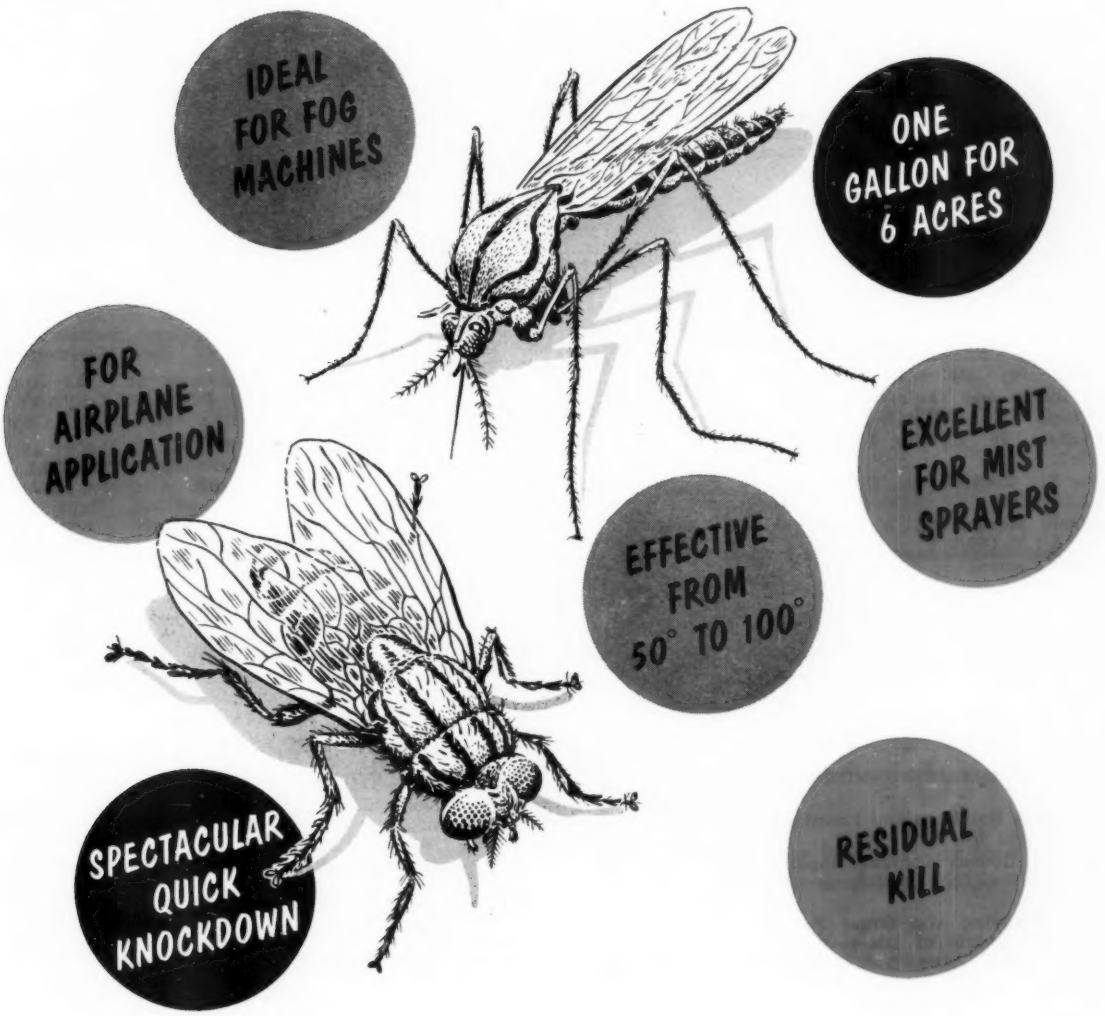

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Government Publications Of Interest to Operators

The following insect and rodent control government publications of special interest to PCOs are available from the Superintendent of Documents, Government Printing Office, Washington 25, D.C. at the prices listed. When ordering make sure that the Catalog Number is included. Send money in currency or coins; no stamps.

Insects (1952 Agriculture Yearbook), $2.50, Catalog No. A1.10:952.

Protection of Log Cabins, Rustic Work, and Unseasoned Wood from Injuricus Insects, 10c, Catalog No. A 1.9:1582/6.

Preventing Damage to Building by Subterranean Termites and Their Control, 15c, Catalog No. A1.9: 1911/3.

Decay and Termite Damage in Houses, 10c, Catalog No. A 1.9: 1993/2.

Control of Nonsubterranean Termites, 10c, Catalog No. A 1.9:2018.

Cockroaches and Their Control, 10c, Catalog No. A 1.35:144/3.

Silverfish, 5c, Catalog No. A 1.35: 149/3.

House Fly Control, 10c, Catalog No. A 1.35:182/3.

Domestic Mosquitoes, 10c, Catalog No. A 1.35:186/2.

Chigger Control, 5c, Catalog No. A 1.35:302.

Collection and Preservation of Insects, 15c, Catalog No. A 1.38:601.

Clothes Moths and Carpet Beetles—How to Combat Them, 15c, Catalog No. A 1.77:24.

Ants in the Home and Garden—How to Combat Them, 5c, Catalog No. A 1.77:28.

Rat Control Methods, 5c, Catalog No. 1 49.4:13.

Rat Proofing Buildings and Premises, 10c, Catalog No. 1 1.72:19.

Insect and Rodent Control, Repairs and Utilities, 75c, Catalog No. M 101.18:5-632.

General Spraying and Other Practices for Control of Diseases and Insects That Attack Trees and Shrubs, 15c, Catalog No. 1 29.26: 6/3.

Rats, Let's Get Rid of Them, 10c, Catalog No. 1 49.4:22.

The Gas Mask, 60c, Catalog No. D 101.11:3-205.

New Entoma Now Ready

The tenth edition of Entoma, a directory of insect pest control, loaded with valuable information, published by the Entomological Society of America, is now available.

For copies of this publication write George S. Langford, Editor, Department of Entomology, University of Maryland, College Park, Md. Entoma sells for two dollars a copy.

patents

RELATING TO PEST CONTROL

By Dr. R. C. Roark
U. S. Department of Agriculture

Copies of all patents can be obtained for 25 cents (no postage) sent to the Patent Office, Washington, D. C. In ordering a copy of a patent the number of the patent, the date, the name of the patentee, and the subject of the invention should be stated.

2,635,010 (Apr. 14, 1953; appl. Feb. 27, 1950). **SPRAY GUN.** Elmore J. Sanders, San Gabriel, John Allen Wiens, Burbank, and Edison J. McClave, Los Angeles, Calif.

2,635,309 (Apr. 21, 1953; appl. Sept. 7, 1949). **APPARATUS FOR CLEANING GRAIN AND DESTROYING THE INSECT LIFE THEREIN.** Franklin S. Smith, North Haven, Conn.

2,635,920 (Apr. 21, 1953; appl. Aug. 2, 1949). **SPRAY APPLICATOR.** William E. Boyce, Ridgeway, N. Y.

2,639,617 (May 26, 1953; appl. July 3, 1952). **METHOD FOR DETERMINING INSECT PARTS IN CEREAL FLOUR.** Roger A. Larkin, Peoria, Ill. — Secretary of Agriculture. A method of rendering insect parts visually distinguishable from components in cereal grains comprises subjecting a mixture of said parts and said components to the action of a 0.020—0.030 percent aqueous solution of Crystal Violet dye.

2,640,293 (June 2, 1953; appl. March 7, 1949). **MOUSE AND RAT TRAP.** Ira A. Cook, Westminster, Calif.

2,640,726 (June 2, 1953; appl. Jan. 5, 1948). **SPRAY GUN.** Isaac S. Prescott, Orlando, Fla.

2,645,592 (July 14, 1953; appl. March 2, 1950). **PEST CONTROL CHEMICALS.** Ramsey G. Campbell, Richmond, Calif. — Stauffer Chemical Company. An acaracide comprises a powder carrier and an effective concentration of a material selected from the group consisting of 4-chlorophenyl 4' fluorophenyl sulfone and 4-bromophenyl 4' fluorophenyl sulfone in the form of powder.

2,645,877 (July 21, 1953; appl. Dec. 1, 1951). **INSECT TRAP.** William A. Pohlman, Horicon, Wis.

2,646,440 (July 21, 1953; appl. Nov. 20, 1951). **ORGANIC ARSENO POLYSULFIDES.** Roland M. Kary, Metuchen, N. J. — American Smelting and Refining Company, New York, N. Y. Arseno methane poly (2) sulfide proved more toxic than DDT and other insecticides to confused flour beetle, granary weevil, Mexican bean beetle and carpet beetle larvae.

2,648,569 (Aug. 11, 1953; app. June 24, 1947). **LIQUID SPRAYER.** Edwin W. Vose, Orange, N. J.—Spray Process Co. Inc.

2,648,681 (Aug. 11, 1953; app. June 4, 1951). **PROCESS FOR THE PRODUCTION OF A RODENTICIDAL COMPOSITION.** Franz Litvan and Willy Stoll, Basel, Switzerland — J. R. Geigy A. G., Basel, Switzerland. A process for the preparation of a crude rodenticidal mixture consists in melting together substantially equimolecular proportions of 4-hydroxycoumarin and benzal-acetone in the absence of any liquid diluent, heating the melt at a temperature of at least 120° for several hours and pulverizing the solid crude reaction product when cold.

2,648,682 (Aug. 11, 1953; app. Jan. 3, 1951). **3-SUBSTITUTED 4-HYDROXYCOUMARINS AND PROCESS FOR THEIR PRODUCTION.** Willy Stoll and Franz Litvan, Basel, Switzerland — J. R. Geigy A. G., Basel, Switzerland. These compounds are rodenticides.

2,648,683 (Aug. 11, 1953; app. May 16, 1952). **4-HYDROXYCOUMARIN DERIVATIVES.** Franz Litvan and Willy Stoll, Basel, Switzerland—J. R. Geigy A. G., Basel, Switzerland.

2,649,335 (Aug. 18, 1953; app. Feb. 14, 1950). **PORTABLE SPRAY PUMP** Fred W. Funke, Oakland, Calif.

2,650,186 (Aug. 25, 1953; app. Dec. 10, 1949). **RODENTICIDAL COMPOSITIONS.** Gerhard Hecht, Wuppertal - Vohwinkel, Hans Henecka, Wuppertal-Elberfeld, and Marianne Meisenheimer, Leverkusen, Germany—Farbenfabriken Bayer Aktiengesellschaft, Leverkusen, Germany. A condensation product of sulfuryl amide and formaldehyde corresponding to the empirical formula $(C_2H_4O_2N_2S)_2$, decomposition point of 255-260° C. is more poisonous than strychnine.

2,651,138 (Sept. 8, 1953; app. Nov. 25, 1949). **POISON BAIT HOLDER FOR EXTERMINATING RODENTS.** William M. Malloy, Stony Point, N. Y.

2,651,591 (Sept. 8, 1953; app. May 7, 1952). **ANTICOAGULANT RODENTICIDE.** Geza S. Delmar, Baie d'Urfe, Quebec and Ernest Neil Macallum, Lachine, Quebec, Canada — Delmar Chemicals Limited, Lachine, Quebec, Canada. A rodenticide composition contains a food product as an edible carrier and as a toxic ingredient at least 0.025% of 3 - (**alpha**-(p-acetamino) - phenyl-**beta**-acetylethyl)-4-hydroxycoumarin.

2,653,894 (Sept. 29, 1953; app. Dec. 29, 1948). **INSECT REPELLENTS.** Melvin S. Newman, Columbus, Ohio, and William B. Wheatley, Syracuse, N. Y.—United States of America as represented by the Secretary of the Army. An **Aedes aegypti** repellent composition comprises 2,5,7-trimethyl-3-octenediol-2,5 in a nontoxic insect-repellent-adjuvant as a carrier therefor.

2,653,895 (Sept. 29, 1953; app. Jan. 11, 1949). **INSECT REPELLENTS.** Nathan L. Drake, College Heights, Md., and Sidney Melamed, Philadelphia, Pa.—United States of America as represented by the Secretary of the Army. An **Aedes aegypti** repellent composition comprises the butyl ester of N-benzyl glycine in a nontoxic insect-repellent-adjuvane as a carrier therefor.

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Expert's Opinion

on

PORCUPINE CONTROL

by

JOHN LUDEMAN

U. S. Fish & Wildlife Service, Boston, Massachusetts

Author Ludeman is veteran wildlife expert.

IT IS UNLIKELY porcupine control will ever become a major headache of the pest control industry.

Porcupines range forested areas, seldom invading settled communities. They are slow-moving creatures, not easily frightened. This trait makes them most dangerous to unwary pedestrians at night, and to inquisitive livestock or foolish dogs at any time.

• Porcupine Damage Expensive

The greatest economic liability of porcupines arises from the damage they do to coniferous and hardwood trees. Inner cabium and phloem layers of a wide variety of trees constitute much of the winter diet of porcupines. Trees growing near winter den sites are often girdled in such a fashion that they can never become marketable timber.

Entire pine plantations have been planted and replanted as a result of porcupine injury. Sugar maples that grow near denning areas often are rendered unfit for tapping purposes.

During the spring, summer, and fall months porcupines change their diet to green succulent plants. Gardens, fields of sweet corn, alfalfa, and orchards of ripening apples are favorite feeding areas. A field of sweet corn can be completely ruined by several nightly visits of a few porcupines.

Although damages are financially greatest to growing crops, porcupines are condemned for lesser damages they do to camps, canoe paddles, and other articles handled by people living in the woods.

At certain seasons of the year they develop a fondness for salt and grease. Articles impregnated with perspiration will be quickly gnawed to pieces if left where porcupines can reach them. Many a canoeist has been literally "left up the creek without paddles" after failing to protect them from these animals.

In former times porcupines enjoyed considerable protection from hunters. It was felt a person lost in the woods might possibly stave off starvation by killing a porcupine. This protection is still observed in many areas; however, some states are now offering bounties for the animals.

Yellow-haired porcupine roams western states.

• Porcupines in U. S.

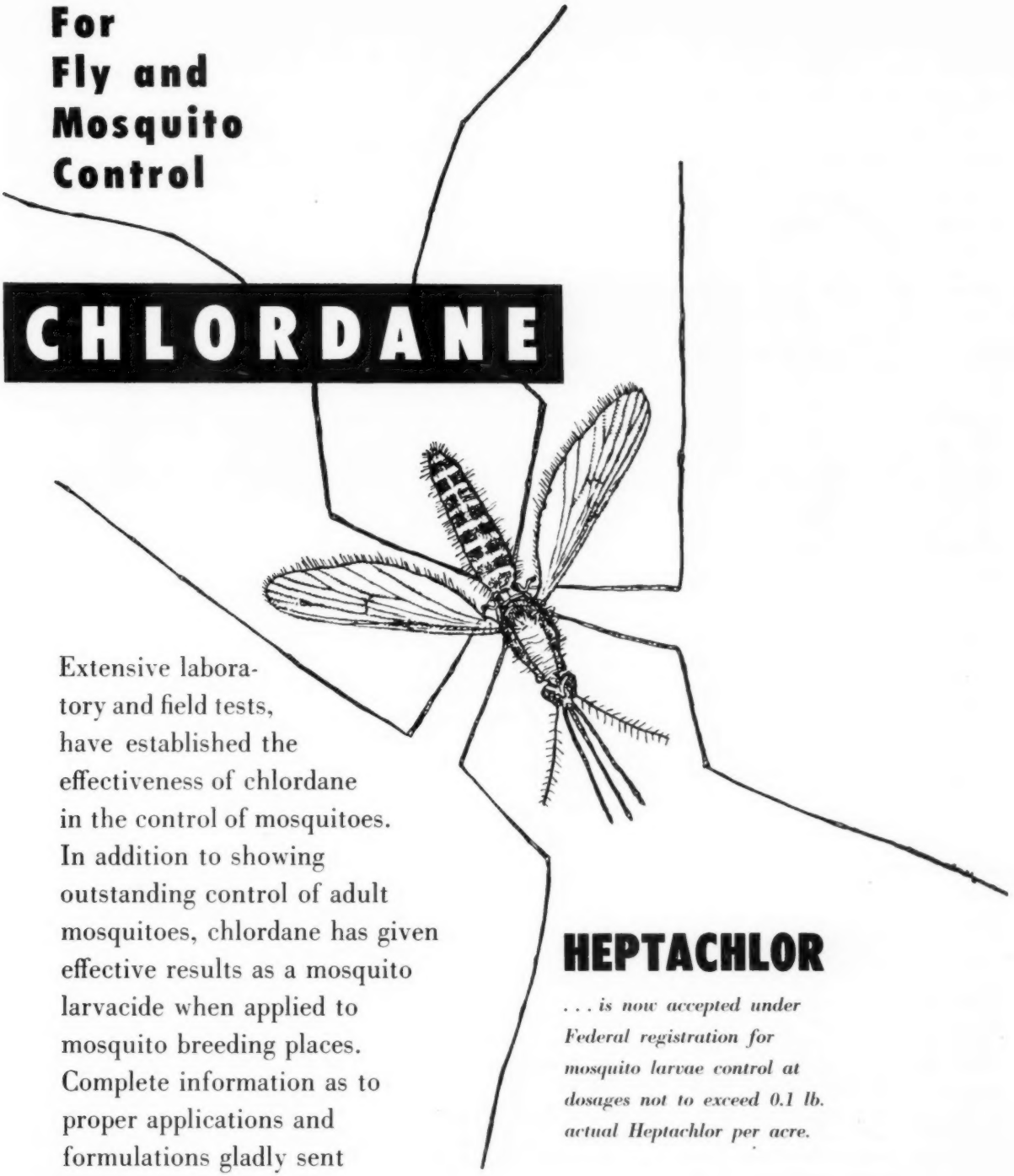
Two species of porcupines are found in the United States. The Canadian porcupine *(Erithezon dorsatum)* ranges forested land in the northeastern states to Pennsylvania, and westward to the Great Lakes region. The Yellow-Haired porcupine *(Erithezon epixanthum)* occurs from the Great Plains to the Pacific Ocean, southward in the Rocky Mountains through Arizona. As his name implies, his body pelage is tinged a slight yellow. Colors in both species of porcupine vary from black to faded brown. Albinos have also been reported on several occasions.

• Physical Characteristics

A porcupine's body is thickset and heavy, often weighing twenty pounds. The head is small with the face or muzzle almost bare. From

For Fly and Mosquito Control

CHLORDANE



Extensive laboratory and field tests, have established the effectiveness of chlordane in the control of mosquitoes. In addition to showing outstanding control of adult mosquitoes, chlordane has given effective results as a mosquito larvacide when applied to mosquito breeding places. Complete information as to proper applications and formulations gladly sent upon request.

HEPTACHLOR

. . . is now accepted under Federal registration for mosquito larvae control at dosages not to exceed 0.1 lb. actual Heptachlor per acre.

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the top of the head to the tip of the tail is a dense covering of slender sharp pointed quills, four or more inches in length and barbed on the outer end. They are loosely fastened to the animal's body and dislodge easily. The chest, belly and underside of the tail are unprotected by the armor of quills.

Porcupines have a short wooly pelage with longer guard hairs which protect them against cold winter days. The eyes are relatively small and do not reflect lights at night as do other nocturnal animals. When danger threatens, porcupines draw their heads down between their front legs and arch the back. Quills are raised to an erect position and any object that approaches too close is met by a quick slap of the tail. Barbs that are driven in by the tail slap are difficult to remove and continue to work inwards until a vital organ is reached.

If the quills are received in the face, the unfortunate victim usually starves to death. Few predators molest porcupines. The fisher, bob-cat, and mountain lion or cougar can successfully kill the animal, but they usually attack while it clings to a tree trunk where its defensive movements are restricted.

• Most Active at Night

Porcupines are most active at night and spend daylight hours in rocky dens, or at rest high in a tree. Some trees are apparently prized as such resting spots. These are often used as poison bait stations when populations must be reduced in the western forest areas. The porcupine is ordinarily a solitary creature and seldom found in large numbers. Exceptions occur when they invade prize feeding areas and during winter denning periods when several may inhabit the same rock slide or quarry dump.

Mating takes place in early fall. A single young is born the next spring between April and June. It weighs about a pound at birth and arrives with a full set of quills. These are soft at first but harden within thirty minutes. Young porcupines begin feeding on vegetation quite early in life and are soon able to fend for themselves.

• Hunting Is Best Control

Hunting is one of the most efficient means of control; however, it can be time consuming. Summer hunting is not considered efficient unless damage is occurring at some particular area, i. e. corn field, orchard, alfalfa field, or forest plantation. In these cases, nightly visits, armed with a strong light and a small caliber rifle, will usually result in eliminating the culprits. Clubs can be substituted for guns when the latter cannot be used because of regulations. Best hunting occurs during the first four hours after sundown. Good results are reported from the north central states by cruising forest roads in cars during the early evening from mid - September to mid - October. Porcupines are then feeding on roadside vegetation and can be readily detected and killed. This method is used to prevent damage to forest plantations that would occur later in the winter.

• Trapping Best In Winter

Trapping is most easily undertaken while snow is on the ground. Trails through the snow are readily followed to active den sites. A size 1½ steel trap is countersunk to general ground level at the den mouth. The trigger pan is positioned to one side of the center of the trail and a piece of fluffy cotton is placed under it to aid in preventing snow from freezing under the trigger. As the porcupine is low-slung he may snap the trap several times before being captured. Traps should be inspected once or twice a day since daily visits are required by law in many states.

• How To Protect Trees

Orchard and ornamental trees can be protected by erecting a small circular fence around the tree trunk. Leave a 6-inch gap where the two ends of the fence would ordinarily meet. A steel trap set in the opening will often catch the varmint the first night. Stake the trap in such a manner so that a trapped porcupine cannot reach the trunk of the tree or severe damage may occur.

When porcupines are known to be entering an area from one direction, a short drift fence is often sufficient to shunt them around an area to be protected. Traps set at both ends of the fence will remove the animals if desired.

• "Hot" Wire

To prevent porcupines from climbing over the barrier, use electric fence equipment described in the U. S. Fish and Wildlife Service Leaflet 328. The "hot" wire from the machine is mounted on two-inch insulators on the outside of the wire mesh fence. Insulators must be spaced often enough to maintain this two-inch spacing at all places. The "hot" wire should be at least 18 inches above the ground and not less than six inches from the fence top. The negative pole of the controller is attached to the mesh fence and also to an iron stake driven deeply into the ground. Growth must be removed from the vicinity of the fence in order that the "hot" wire is not short circuited. The mesh fence must be staked to the ground to prevent animals from crawling under it. If desired, it can be constructed to completely enclose small areas such as gardens or plantations of prized trees.

• Effective Repellents

Sixty materials thought to have value as porcupine repellents were tested by members of the Wildlife Research Laboratory during 1944-1948. Those showing best results were tested under field conditions by applying them with a brush to latrines, wooden steps on fire towers, and other wooden structures in recreational areas where porcupines were prevalent, and were causing property damage.

The following materials were found most effective for preventing or minimizing damage: (1) copper naphthenate (1 pound to 1½ quarts of mineral spirits); (2) ammonium thiocyanate (10% solution); (3) pentachlorophenol (5% in penetrating oil); and (4) Repellent 96a.

Copper naphthenate and ammonium thiocyanate are most effective in minimizing damage. Under field conditions the latter material dissipates more rapidly than copper naphthenate. Penta-

Since the introduction of warfarin* in 1950...

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millions of pounds of **warfarin** bait

the result—

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USE* warfarin *BAIT . . .
THE TESTED RODENTICIDE

Warfarin's outstanding record speaks for itself! Four years of constant testing under an unbelievable variety of conditions have won for warfarin world recognition. This amazing development of the University of Wisconsin laboratories has been proven effective under all geographical and climatic conditions against all species of rats and mice found in the United States.

As important as warfarin's effectiveness is the organization that stands behind it. The modern research laboratory of the Wisconsin Alumni Research Foundation carefully maintains quality control, answers technical questions, and conducts extensive research in the further application and development of warfarin rodenticides. This is the unique combination that helps you achieve complete customer satisfaction.

*Warfarin is a substance discovered in the laboratories of Dr. Karl Paul Link, Biochemistry Dept., University of Wisconsin, by Drs. Mark A. Stahmann, Miyoshi Ikawa, and Link.

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chlorophenol gives good results but does not offer protection provided by the other two materials. Copper naphthenate imparts a green color to treated wood. If this is objectionable the color can be reduced by increasing the amount of mineral spirits to 2½ quarts per pound of material. It is used extensively as a wood preservative and to preserve cordage and tents. Apparently it has no ill effects, nor does it irritate the skin. More than one application may be required over paint that is in good condition.

• Porcupines Fond of Salt

Porcupines usually attack parts of wooden buildings because of salt the wood has absorbed from sweating hands or perspiring bodies. Porch steps, railings, doors, door jambs, latrines, and horse stalls are most often gnawed by the animals. All such places should be treated to prevent their destruction.

Materials mentioned above cannot be used on living vegetation. When treating living plants protection can be secured by the use of zinc dimethyl dithiocarbamate — c y c l o h e x y lamine complex. Mix with water and apply as a spray, but don't treat edible portions. Garden plants such as beans and peas can be sprayed before the edible portion is formed. Forage crops should not be treated with the material as livestock will refuse to eat it. When protecting growing vegetation, repellent sprays must be applied at regular intervals to protect new growth.

• Use Poison as Last Resort

Employ poisoning operations only as a last resort, or where other methods are too expensive. Operators should be fully aware of the dangers to other animals.

No current bait preparation has shown outstanding effectiveness. A formula used under western conditions consists of one ounce powdered alkaloid strychnine mixed with one pound of table salt. The mixture is pressed into small blocks by adding a small amount of yellow dextrin and moisture, or pasted with a few ounces of soft cooking fat. Cakes should be used only in permanent

(Continued on page 44)

"Custom Fogging" Triples Mosquito Business In Just Five Years

A New Orleans pest control firm is making mosquito fogging operations pay-off in a big way. Operating in the delta city for just five years, Custom Fogging, Inc., now treats 40 sub-divisions and private and commercial areas in and around New Orleans.

So successful have these programs been, that Custom Fogging is said to have tripled its mosquito control services in 1953.

Seven jeeps mounted with either Tifas or Swingfogs give daily fog applications — repeating treatment in each area either two, three or four times weekly, depending upon infestation.

Before treatment is begun, company officials investigate back areas and perimeters to determine the location and degree of mosquito infestations whether from local sources or migratory salt marsh mosquitoes. Results of investigations determine the percentages of chemicals to be used and the frequency of application to be given infested areas. Insecticides used in these operations are chlordane with deodorized kerosene, pyrenone and malathion, or DDT mixed with diesel oil.

Exact formulation is determined by trial and error—those giving best results and longer residual action are naturally used, the firm reports.

Above: Wooded areas around estates and parks are also fogged with a Tifa carried on a jeep. However, Swingfogs are used in places inaccessible to jeeps such as porch areas, behind heavy shrubbery near buildings, and on thick sod lawns.

Left. Mississippi Shipping Company liners are additional customers for this firm. This jeep is mounted with a Swingfog — preferred by Custom Fogging for operations of this type because of its portability. Swingfogs are frequently carried aboard ship to fog staterooms and crews' quarters. With three of these machines operating at once, a large vessel can be treated in a few hours, Custom owner James Wilson says.

Below: Custom Fogging jeep mounted with a Tifa treats homes in a New Orleans residential area. Applications begin at designated hours each day and regular schedules are maintained barring breakdowns and high winds.

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NOW IN 1 and 2 GALLON SIZES

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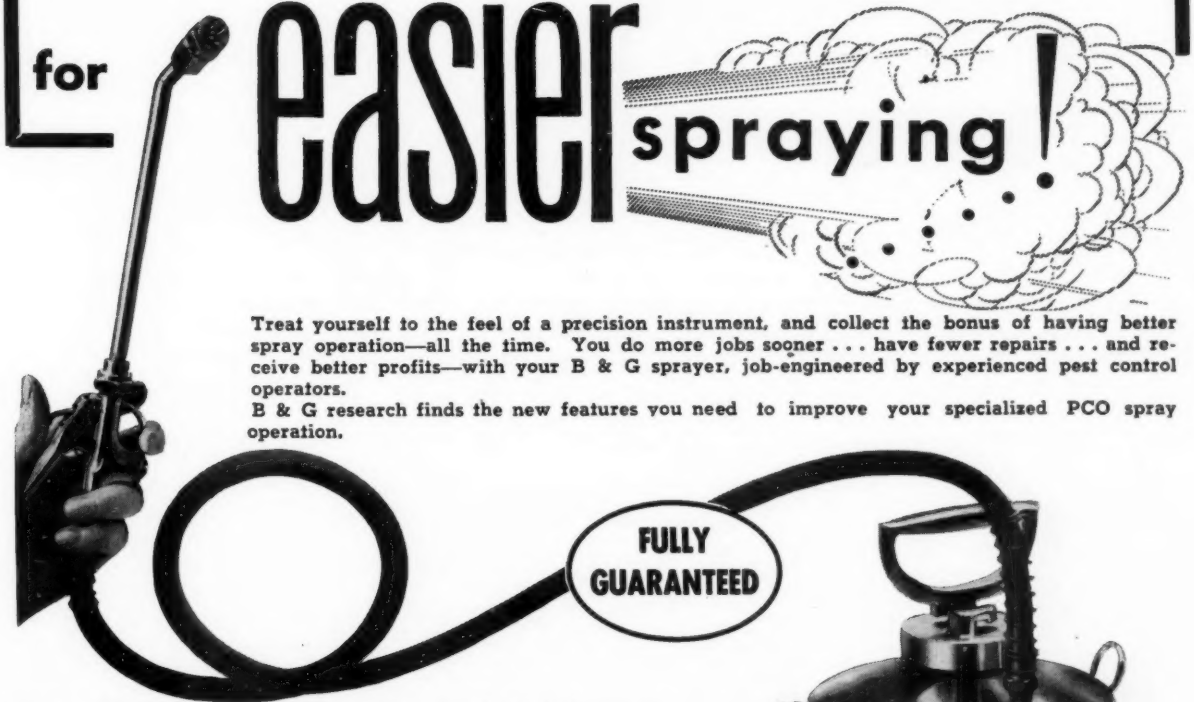

Treat yourself to the feel of a precision instrument, and collect the bonus of having better spray operation—all the time. You do more jobs sooner . . . have fewer repairs . . . and receive better profits—with your B & G sprayer, job-engineered by experienced pest control operators.

B & G research finds the new features you need to improve your specialized PCO spray operation.

FULLY GUARANTEED

PCO's nation-wide use B & G sprayers exclusively because:

ONE GALLON

One gallon stainless steel tank, brass pump unit, adjustable carrying strap, brass shut-off valve, 4-ft. hose unit, 9" angled brass extension, and fan pattern nozzle.

Model 100-S $24.50

With Versatile Multeejet Nozzle

Have four different types of spray patterns in one nozzle simply by rotating tip and tightening retainer ring with finger pressure.

Model 104-S $27.23

TWO GALLON

Two gallon stainless steel tank, brass pump unit, adjustable carrying strap, brass shut-off valve, 4-ft. hose unit, 18" angled brass extension, and fan pattern nozzle.

Model 200-S $29.75

With Versatile Multeejet Nozzle

Four types of spray patterns in one nozzle. Simply rotate tip and tighten retainer ring with finger pressure.

Model 204-S $32.50

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1 and 2 Gallon —

for a PCO spray job, use the proven 1 gal. size . . . large enough yet light to handle. For industrial applications where large volume is required, use the 2 gal. size.

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easier to work with on the job . . . where portability means speed with less fatigue.

Stainless Steel Tank —

and all brass fittings — chemicals cannot injure your sprayer, and maintenance disassembly is quick, trouble-free.

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PEST CONTROL

primer

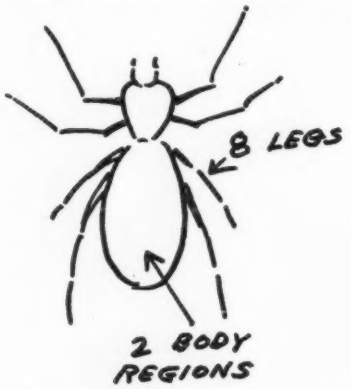
WHAT IS AN INSECT? IV

Written and Illustrated by
Professor Glen E. Lehker
Extension Entomologist, Purdue University, Lafayette, Indiana

This month Glen Lehker gives that portion of his Purdue PCO Conference cartoon lecture which identifies the difference between arthropods. So far he's covered why insect infestations are increasing, how they cause damage, and the general external body structure for insects.

Not All Arthropods Are Insects

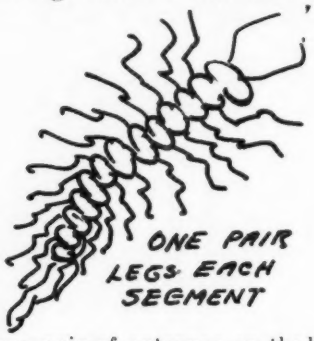
Some other arthropods, often mistaken for true insects, can be easily identified correctly if you know what to look for. For instance, consider the spider:



Spiders, along with ticks, daddy long legs, and mites, are members of the group Arachnida. They differ from insects by having two body regions and four pairs of legs. They also have no wings, antennae, true jaws or compound eyes. They are *similar* to insects in having an external skeleton, simple eyes and trachae.

Another group often mistaken for insects are the Chilopoda or centipedes. This picture of the common house centipede clearly shows the difference between these animals and insects.

Centipedes have only two body regions and no wings, with one pair of legs attached to *each* body segment. The name centipede literally means hundred-footed, although no known species of centipede has this many legs. They *do* resemble insects in having external skeletons and

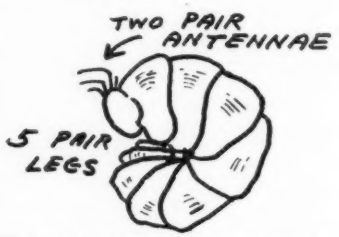


one pair of antennae on the head.

Millipedes (thousand-footed), another insect-related form, look much like centipedes with two important exceptions:

First, millipedes have *two* pairs of legs on each body segment. These legs are shorter than those ordinarily found on the centipede. Second, the millipede has a tendency to curve its body something like the letter C in the alphabet. Like insects and centipedes, millipedes have an external skeleton, one pair of antennae and tracheae.

A fourth insect cousin, the Crustacea, are represented here by the sowbug:



This individual differs from insects in having two body regions, five pairs of legs, joined appendages on the abdomen, two pair of antennae, no wings and no tracheae. Their only similarity to insects is the external skeleton and one pair of compound eyes. Next time you sit down to a lobster dinner, notice that brother lobster has five pairs of legs. He's a member of this water-loving group, too.

Next Month: Insect Mouthparts

PEST CONTROL

notebook

What Is It? IV

Now that you've become an expert (?) at identifying insects by a word description of some phase of their activity, let's see how you can do with the one below written by another member of Pi Chi Omega.

Prepared by G. E. Lehker

Round holes about the size of a lead pencil or a little larger are often found in the siding and exterior trim of houses and other buildings of wooden construction. The holes are either on an outside surface or in such a position that the insects making them have a ready access to the out-of-doors. You would not expect, therefore, to find damage to hardwood floors, interior trim or to basement joists of houses. On the other hand, the timbers of barns and buildings of open construction are sometimes affected.

If the infested wood is split open one will find that each hole is an entrance to a tunnel of the same size which turns abruptly and runs with the grain of the wood for a distance up to twelve inches or so. The tunnel will be divided into several cells separated by partitions constructed of small chips of wood securely cemented together. What is it?

Answer on page 44

Dieldrin For Turf Pests

Dieldrin, Shell Chemical Corporation's insecticide, is now being produced in granular form for use against turf insects and other soil pests. It is effective against lawn chinch bugs, white grubs, ants and Japanese beetle grubs, Shell says.

Well suited for control of insects that feed at ground level, water spread on the lawn after treatment will force dieldrin into the earth where it destroys subsurface pests, it is said.

A 5% granular dieldrin formulation can be applied at the rate of one pound per 725 square feet for turf insect control.

You can get full details by writing Shell at 50 West 50th Street, New York 20, New York.

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H ighly toxic to termites, yet safe near plants and shrubs, **RESIDEX-50** contains milder chemicals than the usual irritating chemicals used for **TERMITE CONTROL.** This is a non-clogging, fire-defying emulsion without the strong odor usually associated with other soil chemicals.

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A Section of PEST CONTROL magazine

TERMITES

and other enemies of wood

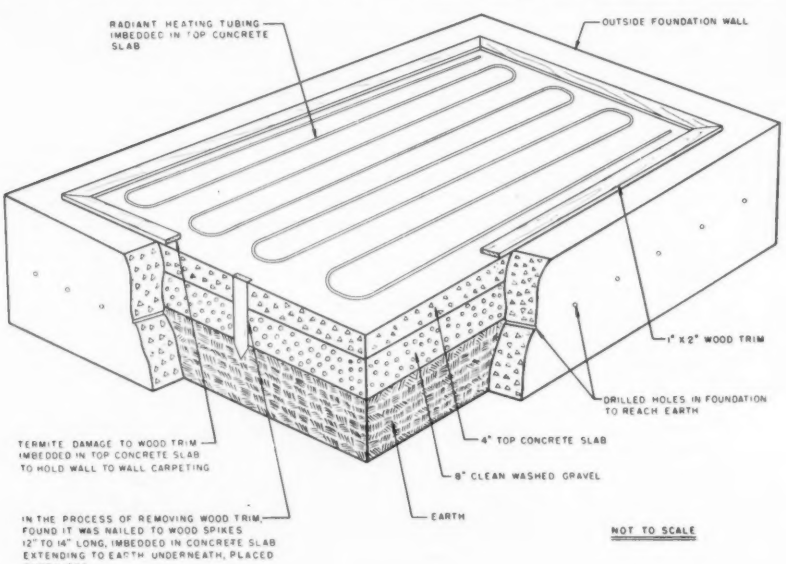
Termites Found "One Flaw" In $50,000 New York Slab Home

By CHARLES POMERANTZ
Bell Exterminating Co., New York, N. Y.

During the past few years the ranch type home set on a cement slab foundation has become increasingly popular in the residential areas around New York City. Because of the severity of the winters in this latitude, space heaters so characteristic of California and Florida ranch homes are inadequate and reliance must be placed on some type of central heating. The usual procedure in this area is to imbed hot water pipes in or just below the cement to make the top of the slab a radiating surface. In addition to the many fine features of ranch type homes, those promoting their sale often introduce as a "clincher" argument to a termite- conscious prospective buyer the statement that slab foundation offers eternal protection against termite invasions. This paper reports on a termite infestation noted in a slab house in the New York area and the corrective measures which were employed.

This home is one of the "better" ranch homes with a market value of around $50,000.00. It was built by a private contractor under the supervision of an architect employed by the owner. Only the finest materials were used; the workmanship, except for one flaw was superior. Oak was generously employed in window and door frames, in doors and in the paneled wainscoating of many of the rooms. The owner was well pleased with his house since it had an individuality of its own rather than being one of many similar homes in a mushrooming development.

Top: Carpet pulled back to show wood trim where termite damage started. **Middle:** Wood stakes found imbedded around periphery of one room. **Bottom:** One-inch galvanized pipes placed in openings where wood stakes were found.


RADIANT HEATING TUBING IMBEDDED IN TOP CONCRETE SLAB
OUTSIDE FOUNDATION WALL
1" X 2" WOOD TRIM
DRILLED HOLES IN FOUNDATION TO REACH EARTH
4" TOP CONCRETE SLAB
8" CLEAN WASHED GRAVEL
EARTH
TERMITE DAMAGE TO WOOD TRIM IMBEDDED IN TOP CONCRETE SLAB TO HOLD WALL TO WALL CARPETING
IN THE PROCESS OF REMOVING WOOD TRIM, FOUND IT WAS NAILED TO WOOD SPIKES 12" TO 14" LONG, IMBEDDED IN CONCRETE SLAB EXTENDING TO EARTH UNDERNEATH, PLACED EVERY 3FT
NOT TO SCALE

Schematic plan of foundation slab under termite infested house treated by Bell Exterminating Co.

● Trouble 18 Months Later

Eighteen months after this home was occupied, damage to the edges of the wall-to-wall carpeting was noted and an infestation of moths was suspected. Later, however, a flight of insects occurred and suspicion was directed towards termites. At this point we were asked to make an immediate study of this problem since the wife, frightened by the termites, was urging her husband to sell the property.

Our study disclosed the following:

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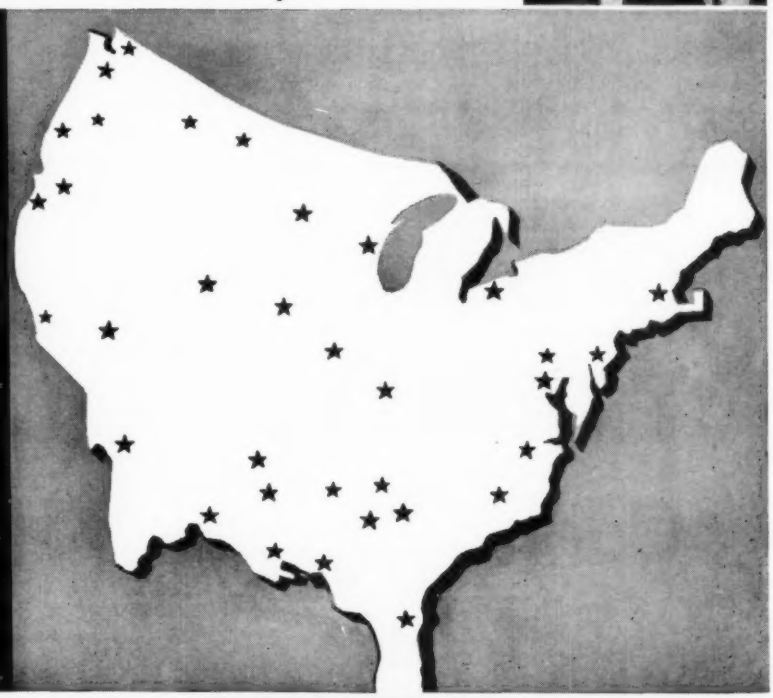

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☐ Please send prices on your complete line.

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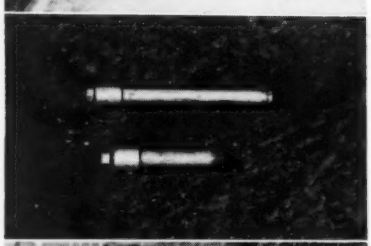
Outside Survey

1. No stumps or dead trees near the house. 2. Drainage system was well away from the house. 3. Foundation was of poured concrete (later found to be 12″ thick). 4. Outside wall construction was of brick veneer; the outside foundation wall provided a 4 inch offset. 5. Outside grade (earth level) was below top of foundation walls. 6. Front entrance patio was on line with top foundation wall. 7. Side terrace entrance was well below the top of foundation wall. 8. Outside shrubbery was away from the house with the exception of one area where the plantings were too close for comfort. We removed the shrubbery and later replanted each item 18 inches from the wall.

Inside Survey:

1. Except for a small excavated area (10′ x 15′) which served as a combination boiler and utility room, all of the living area was on the slab. The boiler room was dry and well ventilated. A few termite tunnels were noted on the foundation walls near the oil burner. 2. Wood trim 1″ x 2″ was

(Continued on page 38)

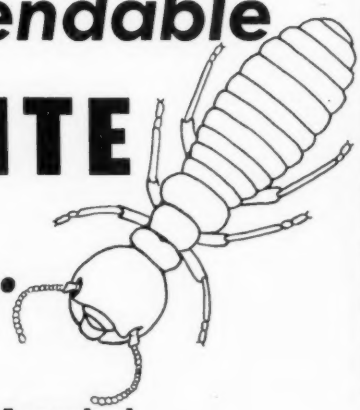


Top 1: Foundation wall was covered with roofing cement and old four-inch drain replaced. **2:** Recemented channel alongside one inside wall. **3:** Two lengths of one-inch galvanized pipes with removal caps set in cemented channel. **Bottom 4:** Holes were drilled into foundation wall two inches below gravel bed.

for Dependable

TERMITE

Control..



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3 Inches
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The light, rugged, easy-to-use C-100 uses a jack hammer that weighs only 14 pounds and is automatically self-rotating. Two carbide tipped steel drills with the adapter to fit hammer are included. Each drill is 12" long with a ¾" diameter and will average 2,000 feet of concrete drilling each . . . and do a neat job without chipping adjacent concrete. Also included are 2 fifty foot lengths of braid and a 1-inch wear-resistant air hose with snap-on couplers.

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$50,000 Slab Home

(from page 36)

imbedded around the periphery of every room except the kitchen. 3. There was wall-to-wall carpeting in all rooms except the kitchen. Carpets were tacked to the wood trim. 4. Damage was confined to carpeted areas in the living room at the point of contact with wood trim. 5. Damage was evident to a number of places in the wood trim imbedded in the concrete slab. There was activity by workers and soldiers. 6. We removed part of the damaged trim and found the top of the trench into which the trim was imbedded, to be rough and porous, indicating the possible quick absorption of termite chemicals that might be applied and an excellent medium for termites to enter. 7. Lower part of the inside partition walls of the living room was made of fine wood panels. All walls were in good condition without a sign of termite activity, dry rot or powder post beetle invasion. 8. We were not permitted to remove any base mouldings or panels to see if any termite damage was evident in the inside partition walls. 9. Walls of all other rooms were examined without any outer signs of termite damage or activity. 10. There were no signs of any termite activity to closet walls. Door saddles and frames seemed free of termite damage. 11. We found cracks in the concrete slab.

- **Plans Differ From Construction**

The localization of the damage in the peripheral trim of the several rooms promoted us to examine the building plans for any possible flaw in construction which might account for the ingress of termites. These plans were of little use since it was immediately recognized they did not reflect existing conditions etc. Blue prints did not show wood trim imbedded in the periphery of the rooms nor the manner in which radiant heating pipes were laid.

We consulted with the owner and he advised us that during the early stage of construction, he had requested the contractor to place a 1″ x 2″ wood trim around the periphery of every room, except the kitchen, for the purpose of tacking the wall-to-wall carpet that was to go on the slab floors of each room. We discovered that the wood trim, laid to hold the carpets in each room, was nailed to and held in place by 2″ wood stakes about 12 to 14 inches deep, placed about 3 feet apart. These wood stakes, apparently were driven through the 8″ washed gravel touching the soil underneath, the trim nailed to the stakes and the concrete slab poured around them. This apparently was done in order to reinforce and to hold in place the 1″ x 2″ peripheral trim.

A schematic plan of the foundation slab is shown on page 34. It may be seen that ingress to the peripheral trim via the wooden spikes and through the rough finish under the 1″ x 2″ trim could be accomplished without difficulty.

- **Corrective Measures**

Outside Area:

Shrubbery as necessary was removed or otherwise protected and a trench three feet in depth was dug around the entire perimeter of the house. The bottom of the trench was rodded at two foot intervals to a depth of four feet; the combination of trenching and rodding permitting the introduction of soil poisons to a depth of seven feet. Holes were based at two foot intervals along the foundation wall at a point two inches

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20% Technical Chlordane solution. Dilutes 1 to 10 with oil to make a 2% solution for roaches, waterbugs, silverfish, ants, carpet beetles, etc.

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46% Technical Chlordane solution. Dilutes 1 to 23 with water or 1 to 29 with deodorized kerosene. Remains stable for long periods after dilution.

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below the washed gravel bed (see Fig. 1 on page 34) Termite chemicals were applied generously to the trench, rodded holes and to holes in the foundation walls and to the backfill of the trench.

Following application of the chemical, all cracks in the foundation wall were repaired and the entire exposed foundation surface was covered with a good quality of asphalt roofing cement. One damaged 4" drain was replaced and properly supported to avoid earth pressure and subsequent breakage.

Inside Area:

All of the peripheral trim in the several rooms damaged or undamaged, was removed as were the wooden spikes present at regular three-foot intervals. A few of these spikes were sound but most were damaged due either to termite activity or dry rot. Each spike opening was cleaned thoroughly and served as an entrance for a liberal application of poison to the soil below. The entire trench, left open by the removal of peripheral trim, was flooded with termite chemicals. After removal of the wooden spikes we imbedded into each opening a one inch galvanized pipe 6" to 10" in length with a removable cap. This was done to allow for future treatment solely as a preventive measure.

• Discussion

Blame for the termite infestation described above can be placed on the following: settlement cracks reaching wood trim around the periphery of the rooms; the rough porous finish of the trench holding the trim; and lastly, the wood spikes used to hold the trim in place. It is almost inconceivable that such a difficult procedure was adopted. There is a clear indication that a termite control operator could serve a very useful role as a consultant in advising architects, owners and contractors of termite potentialities during the planning and early stages of construction.

Termite Drills Reduced

Termite Drills, Inc., has announced a price reduction on all Termite rotary masonry drills up to and including 1 3/16" diameter.

A catalog listing new prices and complete information on all lengths, diameters and recommended uses for the company's products is available by writing to Termite Drills, Inc., 99 N. Lotus Ave., Pasadena 8, Calif.

Believe Only What You See

Precautions to Watch in Treating Slab-Houses for Termites

By CHARLES H. DENNY
St. Louis, Missouri

Part II

(Continued from March issue)

While inspecting the exterior of a slab-type house, here again treat blueprints and specifications with skepticism. Always measure a house rather than taking dimensions from a blueprint. The PCO who measures the house may be bidding on 25′ more foundation than you are, if you took the dimensions from a blueprint. Don't wait until after you are the successful bidder to find this out.

• Surface Drainage Critical

Surface drainage is extremely critical with slab-type construction. Surface water leaking through a foundation in a house with a basement is easy to detect, there are usually drains in the basement to carry the water away. While it would seem practical to install tile drains under a slab-type house, I have never found such drains and have often wondered if such drains are ever installed. Such drains would seem to be an excellent form of waterproofing. They would lower the moisture content in the soil under the slab, thus making the soil under the slab less attractive to termites. Many of us have seen soil under partially excavated areas that was so dry that termites were apparently unable to maintain colonies, even though there was wood debris on the surface of the soil, and the soil temperature was always above 50°F. Low soil moisture content was apparently keeping termites under control. Absence of gutters, or gutters and drains that are not functioning properly, can contribute to wet soil under the slab.

• Was Area Wooded Before?

From observation, you have probably noticed that wooded areas have a high termite population. It is a wise precaution to consider what was on the ground before the house was built. If large native trees are near the house, isn't it natural to suspect that trees may have been cut down so the house could be built? It is more expensive to remove stumps than it is to leave them under a slab-type house, so give this due

for termites, no escape

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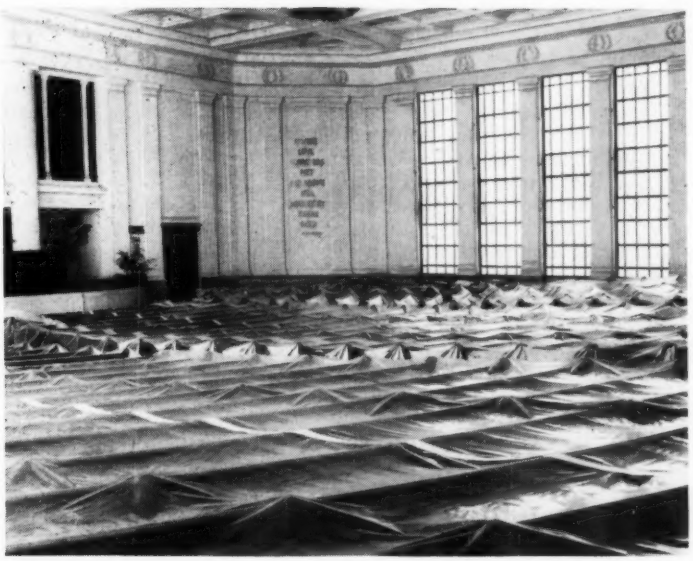

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Address_____

City_____ Zone_____ State_____

consideration. Don't let a specification or a good plaster job fool you on foundation construction. Remember, brick, tile, and hollow concrete blocks have voids that termites utilize as express highways. Settlement cracks and poor mortar joints allow termites to enter, they also permit water to seep under the slab.

The height of the top of the foundation above the soil or grade line is a critical factor. Porches, patios, walks, terraces and attached garage floors usually raise the soil line above the top of the foundation. Wood forms and cellulose containing debris are often found in earth fills which are often associated with these structural features. Too much caution cannot be observed in analyzing these construction features for termite hazards, when prescribing treatment. Think back. How many of these construction features were involved in retreatments you have found necessary?

● Protect Against Drought Damage

Shrubs, vines and trees have a dollar value five or ten times your fee for termite control. Certain types of evergreens carry especially high price tags, this is also true of shade trees. Ivy and other types of climbing vines often require years of patient care by the owner to get them to cover the walls of his castle. You can destroy this investment in pride and the labor of your client with your termite control treatment. You may not only lose the profit out of the job, but the profits from past and future jobs by your carelessness in prescribing the application of your treatment. The prolonged drought over the past two years has weakened and killed many trees and shrubs. Have a definite agreement with your client before you start the job. Don't leave your firm open to pay for trees and shrubs that were killed by drought.

● Insulation May Hold Moisture

Water leaking into exterior walls of slab-type construction is much more critical than in conventional construction where leaks can be discovered while inspecting basement. Isolated infestations of termites can remain active in walls, ceilings and even roof members after a successful soil treatment has been applied, if they are able to secure moisture. In such cases, insulating materials may be holding moisture that leaked in from gutters, or around window or door frames. Such leaks can also travel down through the walls and keep the soil wet under the slab. Special attention should be given to leaks in frame construction that is veneered with stone or brick. Remember that water running down the inside of chimneys can supply moisture for isolated termite infestations, and in some cases keep soil under slab wet.

In conclusion, may I caution that you diagnose every construction feature that is vulnerable to termite attack. Study methods of slab-type construction when you have the opportunity to examine a house under construction, your time will be well spent. Verify blue-prints and specifications by inspection and measurements. Believe only what you see. The control of moisture in exterior walls and under the slab is of critical importance. Inspect the base of all interior walls; these walls can be more subject to termite attack than exterior walls. Be positive that you understand the floor construction and waterproofing of the slab, if waterproofing is used. Make a scale drawing of the foundation plan of every structure you treat, and record your inspection notes for future reference. Learn to diagnose, prescribe and apply termite control treatments for slab-type construction that will be a credit to your firm and to the pest control industry.

"There will be a slight delay on our call madam, - Right now we're - ah - taking inventory!"

ARPS Not Followed (Letter)
(from page 6)

ness. There have been large amounts of helpful information and they serve to keep us in touch with the industry nationally.

From time to time, items have been published that were controversial, but this could be expected, since there are differences of opinion among the operators throughout the country. However, I take exception to the story in your February 1954 issue entitled "Here's How A Mid-Western TO Controls Termites in Basement of a 4-Store Block." While the caption is in accord with the story, it may convey to the unlearned that this job was performed in accordance with the Approved Reference Procedures of the NPCA; in fact you have a photograph showing the operator reading a copy of the NPCA's ARPs.

The start of the story confirms a serious termite infestation in a one-story block of four stores. According to a diagram of the floor plan, termites have entered through the mortar joints below grade on the south side and on the east side, and are in a partition wall in the basement. The floor joists are below grade.

The basic principle in Subterranean Termite control is the prevention of simultaneous access to both cellulose food and moisture. On page 3 of the ARPs, it is specifically stated that, "It is important that direct contact of wood or other cellulose material with the soil or other source of moisture should be broken. Mechanical alteration is the most direct way to accomplish this, through the removal of the wood from the soil or the soil from the wood, or through such other alterations as structural changes, or the installation of mechanical alterations impervious to termites."

A mechanical barrier was installed at the base of the stairway where there was no evidence of termites and yet no mechanical alterations were performed on the exterior of the building through which the termites entered and attacked the supporting wood members of the structure. Instead, holes were drilled at various intervals through the concrete sidewalk and chemical was injected through these holes into the soil. I can't conceive how it is possible to obtain chemical saturation by drilling holes through concrete.

The first recommendation that we would have made would have been to:

Remove a portion of the side-

Investigate

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For Termites and Powder Post Beetles

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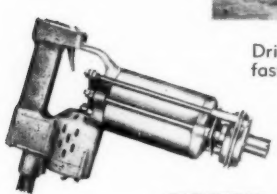

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Deliver 3600 power packed blows per minute — each blow cuts time and costs on toughest concrete or masonry jobs. Drill, cut or chip ten times faster than by hand. Electromagnetic operation.

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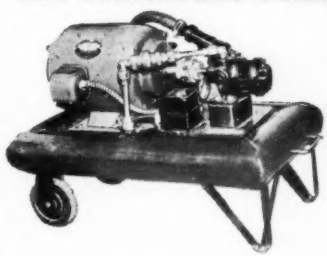
PRESHUR-MITE

Before you invest in pest control equipment — investigate **PRESHUR-MITE**. You'll see why Pest Control Operators all over the country praise **PRESHUR-MITE** for **ECONOMY** and **EFFICIENCY**

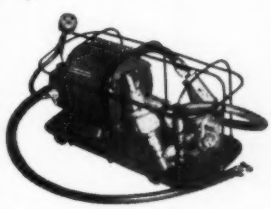
Write for information **NOW**!

The Automatic PRESHUR-MITE



Heavy duty unit designed for termite control work. Pressures up to 225 lbs. PSI and up to 5 gals. liquid per minute. Features automatic pressure switch. Works direct from drum. Weighs only 127 lbs.

The Junior PRESHUR-MITE



Ideal for all types residual spraying, moth proofing, roach and termite control work, etc. Compactly designed for easy handling. Will stand up under rugged treatment. Pressures up to 125 lbs. PSI and up to 2½ gals. liquid per minute. Weighs only 44 lbs.

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Write for Catalog and Price List

A complete line of accessories for termite and general pest control work.

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BIG STINKY
Gal. size - - - - $4.95
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Guaranteed by Good Housekeeping

BIG STINKY Outdoor Fly Traps lure, trap, and kill flies — and once a fly has entered Big Stinky, he cannot escape because of the trap's design.

BIG STINKY has become well known and has been well received in the pest control field. Use Big Stinky yourself and recommend it to your customers this season. It will mean a real help to you in accomplishing good fly control.

For information on network fly control with Big Stinky, Write:

DIOPTRON CO.
BOX 1313 (Unlucky for flies)
MILWAUKEE 1, WISCONSIN

walk adjacent to the foundation wall. Excavate the soil adjacent to the foundation wall to a depth of at least two feet below the level of the beams and the junction of the brick and the foundation wall. We would wire-brush the exposed area in this trench, and point up all voids and joints with cement. A coating of coal tar pitch would be applied over the surface. Chemical would then be applied in the trench and the soil back filled and treated. That part of the concrete walk which we removed would then be relaid and scored neatly. By performing this operation, we would be assured that this is termite-proof and will stay that way for a long time.

You have a picture of the owner of the company holding the ARPs with the caption, "Repeated references to the manual were made while doing the termite job" . . . and yet, no mechanical alterations were performed to the exterior of the building.

My only reason for taking time off to write this letter is because much time and effort has been put in by members of the NPCA for the benefit of our members and the public at large. I do not think a story like this does the industry too much good.

Chester Schwimmer

President
Fumex Sanitation, Inc.
Jamaica, New York

Thanks to reader Schwimmer for writing how he would have treated the termite-infested building described in the article beginning on page 9 in our February issue. His suggestions follow that portion of the ARPs dealing with "Mechanical Alterations."

Pest Control *sought comment from TO Vern Pickhardt, Arrow Exterminating Co., who's control techniques for this job were explained in this story. He reminded us economic considerations often limit the thoroughness with which a job can be performed. He said owner of this 4-store block was not willing to pay the extra cost, which would have been more than double the final charge made, to provide the kind of protection breaking of the sidewalk, trenching and foundation treating would have given. Pickhardt also wanted to dig up shrubbery along the south wall which caused termite-entrance-cracks in the foundation, but these bushes belonged to a next door neighbor who would not permit their removal. He told us he follows the ARPs on all phases of his work, but every job does not permit him to utilize all the recommended procedures outlined in this valuable guide.*

Page 5 of the ARPs includes this sentence: "Incomplete jobs are recognized without prejudice where they can be shown to meet the needs of a given client, or cliental." Mr. Pickhardt's sidewalk drilling is described under the heading "Treatment Along the Outside of Foundations," found on page 45 of the NPCA termite bible.

Both reader Schwimmer and operator Pickhardt are probably correct. The former prescribed ideal methods to follow to give the best possible protection. Pickhardt had the customer's pocketbook to deal with. Both followed recommendations laid down by the ARPs which are intended only to serve as a guide for conscientious termite operators.

Expert on Porcupine Control
(from page 30)

active dens. Such places can be identified by the large accumulations of manure in and about den openings.

Poisoned-salt blocks are sometimes pressed into hollowed wooden blocks which are then nailed high in rest trees previously described. Since many wild animals possess a fondness for salt, care must be taken to keep these blocks out of their reach. This is particularly true in the case of deer and domestic livestock. Strychnine has been tested and abandoned for use against the Canadian porcupine in the East since it is believed that the tannin in the animal's diet counteracts the poison.

WHAT IS IT ?

Answer to description of pest *on page 32*

Large Carpenter Bee

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Get All 3!

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Pump valve limits tank pressure.

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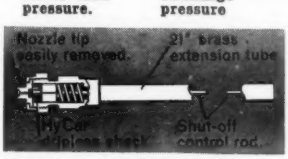

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Other Hudson Sprayers for Professional Use

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Electric Sprayers

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news

Thomas C. Raley

Thomas C. Raley Dies Mar. 1; Was Second NPCA President

One of the National Pest Control Association's organizers and its second president, Thomas C. Raley, 66 years old, passed away March 1 of a heart ailment.

Since 1925, Mr. Raley has held a controlling interest in Getz Exterminators, Inc. with home offices in St. Louis, Mo. One of the key men in industry activities for many years, he assisted Professor J. J. Davis to institute the annual PCO conference at Purdue which served as the model and stimulus for similar meetings in other sections of the country. He attended last year's Minneapolis convention even though he was then in ill health.

Mr. Raley was also active in the Masonic Order, in the Shrine, in Boy Scout work and served as a member of the Board of Stewards of St. John's Methodist Church in St. Louis.

Surviving are his widow, Mrs. Edna F. Raley, a son, George, and three adopted children, John, Ruth and Thomas.

The Getz company is presently being operated by Mrs. Raley with assistance from Phillip and Glen Burnett and Herman Fellton.

3- or 4-Day NPCA Meet?

Members of the National Pest Control Association are being polled to determine their preference regarding the number of days they would like to spend in convention during the annual meet to be held in Miami Beach, Fla., beginning October 17 this year. Adding an extra day would give two afternoons for recreation at this famous vacation and resort town.

Second Arwell Sanitation Seminar in Chicago, Apr. 8

Food plant sanitarians, municipal authorities, and other potential customers for industrial pest control and sanitation are being invited to the Arwell, Inc. second special sanitation seminar, April 8, in Chicago's Sheraton Hotel.

Featured on the program will be W. D. Fitzwater, F&WLS district agent, Dr. E. H. Fisher from University of Wisconsin, Purdue's John V. Osmun, Shelbey T. Grey, FDA, Larry Maxwell from Dow Chemical, George Wanger of Pillsbury Mills, Dr. John C. Flake from the Evaporated Milk Association, R. J. Remaley of American Dry Milk Institute, John T. Carleton of Curtiss Candy Co., and Howard A. York from Pabst Brewing Co.

Louis A. Jansky and **John A. Kielp** are two men recently added to the staff of Arwell, Inc., Waukegan, Ill. Jansky, employed as assistant entomologist, holds a master of science degree in entomology from the University of Illinois. Kielp is new chief inspector for the Arwell sanitation consulting program. He has authored numerous articles on rodenticides and rodent control, and has had many years experience as a meat packing plant sanitarian.

Rodent, flour and cereal insect, fly, and cabinet and carpet beetle control, as well as spot fumigation, sanitation in the grain, candy and brewery industries, will be covered in this one-day meeting. No charge is made to invited guests. A luncheon is included in the program.

W. W. Scott, Arwell president, Emmet Champion, company director of sanitation, and John A. Kielp, chief sanitation engineer have arranged the seminar. The pest control firm is located at 119 Glen Rock Ave., Waukegan, Ill.

Miller Pesticide Bill Submitted to Congress

A bill designed to safeguard the public's health by establishing tolerances on pesticide chemicals used on raw agricultural products has been introduced into Congress by Representative A. L. Miller (R-Neb.).

The bill, H. R. 7125, is a proposed amendment to the Federal Food, Drug and Cosmetic Act of 1938. According to Congressman Miller, the new legislation provides for the prompt and efficient establishment of residue tolerances for farm chemicals used in or on raw agricultural commodities and would protect consumers against excessive residues of these chemicals in food.

Only pesticides used in production, storage and transport of raw agricultural products come under the provisions of this bill. It does not apply to processed foods or chemicals used in processing foods.

On March 8, the Miller Bill was unanimously approved by the House interstate commerce committee and sent to the House floor for passage. So far, there has been no opposition to the bill and indications are that it will have easy passage in both the House and Senate.

Reeves Rose Sanitation Chief

George Reeves, former chief of the St. Louis health division's food control section, was made head of the Rose Exterminator Company's new sanitation service.

Announcing Reeves' appointment, G. L. Clem, Rose St. Louis district manager said, "Mr. Reeves' experience gives him the necessary background to render a real service to our clients."

Reeves new Rose sanitarian.

TERMITE TOOLS for the PCO

NEW ENGLAND CARBIDE TOOLS

ROTARY DRILL BITS • HAMMER BITS

For FASTER and EASIER DRILLING

in any type of masonry

PCE offers a complete line of these valuable tools for the PCO. The carbide tip makes them the longest lasting, hence the most economical.

CYCLO-TWIST Rotary Drill Bits, for use with electric rotary drill or hand brace in soft or medium masonry materials. Available in diameters from ⅛" to 1½". Extra long lengths available. THUNDER-TWIST Hammer Bits for use in green concrete or hard masonry. Available in diameters from 3/16" to 1", long lengths available.

Write for data sheet and price list of New England Carbide Tools.

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Star Drills and Spiral Bits for Hand Hammering. Prdoucts of Star Expansion Bolt Company. A fast and easy cuttting tool giving a round and uniform hole in concrete, brick, stone and tile. Write for list of sizes.

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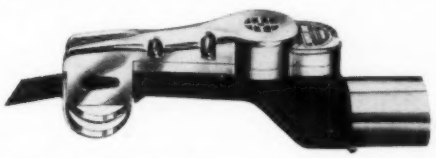
FORGED STEEL TIPPED

For pressure treating Wood, Concrete Blocks and Slabs and Soil Impregnating. A new, long lasting practical tool especially developed for termite operators. Forms leak-proof swedge, with 5/16" drilled hole.

6"	$2.00
12"	2.25
18"	2.50
36"	3.30
Hammer Head	2.95
Hose and shut-off valve attachment	4.50

SUPER SAW PORTABLE POWER SAW

Saves you more actual time, right on the job, than any other tool in your kit.



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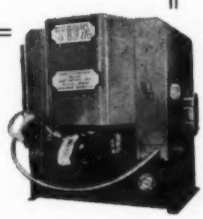
Produces penetrating fog, dry or wet as you wish.

Droplet Control ranges from ½ to 200 Microns.



Carrying UNDERWRITERS' LISTING SEAL

Write for illustrated folder with full details and official comments.

COMBUSTION EQUIPMENT DIVISION

TODD SHIPYARDS CORPORATION 81-16 45th Avenue Elmhurst 73, New York

Abalene Pest Control personnel and families celebrate 25th anniversary of company's founding as they join Walter O. Blank (seated second from right), Abalene president, at banquet held at Scully American Legion Post, in Albany, N. Y. recently. Over 100 operators and guests from the New York and New England areas participated in the merrymaking.

Wyandotte Ups Bahlburg Adds Scott Starkey

John H. Bahlburg has been appointed manager of the recently established new products, organic chemicals department, of Wyandotte Chemicals Corporation.

A chemistry graduate of the Polytechnic Institute of Brook-

John H. Bahlburg

lyn, Bahlburg has been associated with Wyandotte since 1946. In his new position he will be responsible for packaging, handling, labeling and shipping procedures,

Scott Starkey

as well as for spreading information on new products.

The newly created Wyandotte department was organized to simplify the transfer of products from the research and development division to sales. This will result in more personalized service to customers and prospective customers, the company claims.

Scott Starkey, a member of the American Chemical Society, is new Wyandotte southwestern sales representative. He had been on Michigan Chemical Company's sales force.

Industrial Fumigant Expands

Industrial Fumigant Co., Kansas City, Mo., and an affiliated organization, the Winru Chemical Sales Co., have moved into a new office and warehouse at 923 State Line Ave.

A long-term lease was signed for the 13,000 square feet of ground on which is a one-story warehouse-office building. Extensive remodeling and a modern office structure were completed before Industrial Fumigant moved in.

Mrs. L. R. Rukin is president of the firm and T. F. Winburn is general manager. The company also has offices in Chicago, Ill., Portland, Ore., and Minneapolis.

Heptachlor for Mosquitoes

Federal label approval for the use of heptachlor in mosquito control has just been received according to Velsicol Corporation, 330 E. Grand Ave., Chicago 11.

Recommended dosages are as follows: Larvae: apply .05 to 0.1 pound actual heptachlor per acre with ground equipment and 0.1 to 0.125 pound per acre with aerial equipment. For adults apply 0.1 to 0.2 pound actual per acre with ground equipment and 0.05 to 0.1 pound in aerial use.

Hudson Has 10-Gallon Portable Power Sprayer

A new 10-gallon power sprayer equipped with a one horse-power gas engine and called the "Suburban," is being introduced by the H. D. Hudson Manufacturing Co., Chicago, Ill.

Mounted on cushioned-tired wheels, and with adjustable handles, the unit is 21" wide and can be easily pulled or pushed, Hudson says.

The "Suburban" is said to handle all spray solutions at continuous pressure and has a pump capacity of 1½ gallons per minute. A mechanical agitator keeps solutions well mixed during operation.

Other features include a double-acting pump, welded galvanized steel tank, over-size opening in top for easy fillings and cleaning, 10 ft. of hose, and an all-purpose nozzle that adjusts to any spray

Hudson's new "Suburban."

from a fog to a long-range stream. When equipped with a special nozzle boom, it can be used to spray lawns.

For further information on the "Surburban" write H. D. Hudson Manufacturing Co., 589 East Illinois St., Chicago 1, Ill.

F&WLS' Silver Retires

James Silver, director for the Fish and Wildlife Service's Region 4, headquartered at Atlanta, Ga., has retired after nearly 39 years of government service, Secretary of the Interior Douglas McKay announced recently.

Mr. Silver has been active in predator and rodent control since 1912. He is the author of numerous technical articles and bulletins.

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THALLIUM SULPHATE

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1-4 lbs.	$13.00/lb.
5-9 lbs.	$11.50/lb.
10 lbs. or more	$10.50/lb.

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All prices F.O.B. Denver with transportation charges allowed to U.S.A. destinations.

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NOW AVAILABLE — FREE FOLDER DESCRIBING EFFECTIVE BAIT FORMULATIONS. WRITE DEPT. LM.

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COMPARE

The *Challenger* with any other Sprayer on the market!

- ✓ ECONOMICAL
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- ✓ DISPENSES UP TO 5 GAL. HR.
- ✓ NO STEAM, PUMP OR WATER
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INSECTICIDE SPRAYER

INCREASE YOUR PROFITS IN 1954 with the new

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The sprayer that sprays either oil base or water base insecticides!

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G. D. Baerman joins Powell.

Baerman Joins Powell

Gerard D. Baerman is the new northeast regional sales-manager of the John Powell & Co. Division, Mathieson Chemical Corp., New York.

Baerman has previously been associated with the sales staffs of both Geigy Chemical Corporation and Shell Chemical Corporation. A plant pathology graduate of Rutgers University, he served in the Army Corps of Engineers during World War II.

CDC Fly Control Films

Excellent educational sound motion picture films on fly control are available on a loan basis through your local health agency, a CDC regional office, or from the Communicable Disease Center, 50 Seventh St., N.E., Atlanta 5, Georgia. Here is a brief summary of the latest titles. If you write about any of them, be sure to give title and identification number given here.

"Biology of Domestic Flies" M-80, 9 min. Explains the life cycle of the house fly, characteristics of domestic flies (house, blow, flesh, and stable flies), typical breeding places, public health implications of the fly's mechanisms for transmitting disease organisms and filth, and control measures.

"The Collection of Adult Flies" 4-065, 6 min., color. Shows three devices for adult fly collection—sweep net, for rapid survey; fly trap, for detailed qualitative studies, and cone net, for collecting live flies over natural attractants.

"Fly Control Through Basic Sanitation" 4-090, 9 min., color. Shows conditions which favor fly breeding in a community — filth, warmth, moisture, and time for development; outlines specific procedures in urban and rural areas for basic sanitation programs, particularly the elimination of open garbage and refuse dumps.

"Spraying Equipment and Procedures. Part 1: Residual Spraying" 4.091, 9 min., color. Explains the meaning of residual spraying for fly control, the necessity for this type of spraying and the methods of using hand and power spraying equipment.

"Spraying Equipment and Procedures, Part 2: Space Spraying" 4-110, 7 min., color. Explains the application of insecticides for adult fly control in large areas; frequency for use of spraying equipment, mist and fog applicators, and necessary supplementary measures.

"Community Fly Control Operations" 4-094, 12 min. Case history of a successful fly control project in a typical town. Presents basic plan of attack to control flies involving three phases: 1. informing the people and getting their support—education; 2. eliminating the fly breeding sites — sanitation; and 3. applying spraying materials — chemical control.

Purdue Insect, Rodent Meet

A two-day insect and rodent control conference for sanitarians and others concerned with the food industry and public health will be held at Purdue University, Lafayette, Ind., on April 13-14.

The meeting is sponsored by the Indiana State Board of Health, U. S. Fish and Wildlife Service, and Purdue's Department of Entomology.

HERE IT IS! THE NEW "101" MICROSOL

A Junior Model for the Smaller User

$49.50

EXTERMINATES
DISINFECTS
DEODORIZES
HUMIDIFIES

TOP QUALITY AEROSOL GENERATOR

Instantly produces a large volume of fine aerosol particles. Without heat, steam or other propellant!

Here's a profitable re-sale item that you can place in

RESTAURANTS BARS CLUBS
MILK PLANTS CAFETERIAS HOMES

and other small space establishments.

Especially designed for small spaces, the "101" generates an aerosol fog, mechanically and economically. Sell this new portable "101" Microsol and you've made yourself a steady customer for insecticide! Order a supply today!

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All prices F. O. B. New York

Whitmire D.A.I. aerosol bomb.

D. A. I. Designed for Resale

Disposal Aerosol Insecticide, a product of the Whitmire Research Laboratories, is designed specifically for resale by PCOs to customers desiring indoor fly control, the manufacturer reports.

The familiar day-to-day problem of interior fly abatement is reportedly overcome with this new disposable aerosol claimed to produce quick knockdown and high kill of resistant insects. Formulation includes pyrethrins, piperonyl butoxide, allethrin, and a special rotenone development.

D.A.I. bombs can be sold to motel operators, supermarket managers, etc., who may combat their fly control problems in just a minute or two a day, the company claims.

One carton of six ¾ lb. bombs is said to treat more than one million cubic feet. Each D.A.I. is equipped with its own detachable, engineered valve which prevents unauthorized use of this industrial strength insecticide.

Complete information is available by writing Whitmire Research Laboratories, 339 South Vandeventer, St. Louis 10, Mo.

New Promotion Service

Newspaper mats for reportedly fresh and eye-catching advertisements designed to sell pest control services are being offered by Jack R. Levien advertising service, Box 130, Richmond, Va.

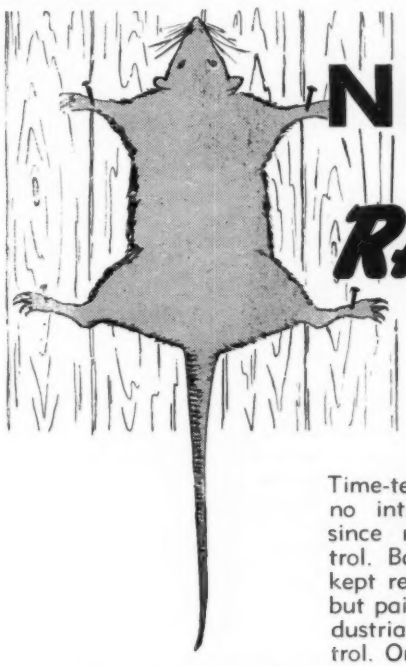
New ads, plus ideas on other forms of advertising are furnished monthly on an exclusive-city basis. Further details will be sent if you write this supplier.

Va. Smelting Picks Nelson

Paul A. Nelson has been appointed southeastern sales representative for the Aerosol Division, Virginia Smelting Company, West Norfolk, Va.

Nelson was formerly with the Agricultural Chemical Division of the American Cyanamid Co. He will maintain his headquarters at 3105 Roswell Road, Atlanta, Ga.

Nelson joins Va. Smelting sales.



NAIL 'em
with
RAT-TROL
(Warfarin)

Time-tested Rat-Trol (Warfarin) needs no introducing. Warfarin has long since made history in rodent control. Baited at suitable stations and kept replenished, Rat-Trol kills surely but painlessly. Designed for major industrial jobs as well as domestic control. Order by the kit and save!

A FULL LINE of
Reliable Pesticides

Need Penta for termite work? Just order Permagard No. 10 Concentrate and mix what you need on the job. Chlordane? Ask for Toxichlor. Lindane? It's Lindex. If it's for pest control, we have it!

Fast Deliveries!

Write today!

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LUBBOCK • DES MOINES • DENVER • TULSA • MINNEAPOLIS • OKLAHOMA CITY • DALLAS
N. LITTLE ROCK • SAN ANTONIO • DAVENPORT • ST. LOUIS • HOUSTON

Kill Flies and other winged disease carriers Electrically

Gardner

FT-180 Door Insectocutor – and portable traps and yard panels – provide certain, safe low-cost protection.

Sell this popularly priced, time-proven equipment

Just as the history-making developments of the past have piled up profits for those who were alert enough to get behind them early, so Gardner electrified fly-killing equipment offers you a golden business-building opportunity today.

These electrified screens have been proven effective wherever they have been used by the nation's leading dairy and food processing plants. They are attractively made to fit over any door, residential or commercial, and they plug into any light socket. It's as simple as that — anyone can do it. Operating costs average less than a penny a day.

Gardner is the pioneer manufacturer of electric screens, holds the basic patent and builds only quality equipment that you can stake your reputation on. Write today for full information and profitable dealer proposition.

Gardner Manufacturing Co.
1454 Kansas St., Horicon, Wisconsin

Resistance Answers Suggested At Record Missouri-Kansas Meeting

Stop-gap answers to resistant flies, roaches, bed bugs, fleas and silverfish came out during the enthusiastically received joint conference sponsored by the Missouri and Kansas pest control associations in Kansas City's President Hotel, March 12 and 13. Registration topped 150.

An educational program second only in calibre to those of regional PCO conferences, included representatives from suppliers, city, county and federal health departments and the National Pest Control Association.

Malathion, praised by Geigy Co. representative E. M. Billings as a "darn good" insecticide, topped the list of chemicals giving control of insects immune to chlorinated hydrocarbons. This new member in the phosphate group of insecticides, in emulsion form, gives good two to three-week control of resistant houseflies. In wettable powder form, Malathion's effectiveness is stepped up to four or five weeks, although the possible unsightliness of the resulting white deposit may be a use-limitation in some places. Addition of sugar to Malathion, recommended by manufacturer American Cyanamid as an acceptance booster, was reported to have its limitations because it may encourage fungus growth.

• 25% Diazinon

Another "phosphate" claimed to be within the allowable toxicity range, is Geigy's Diazinon. Billings said two years field testing reveals 10 week residual activity against non-resistant houseflies and four week control of the resistant species can be expected with Diazinon. When registration is approved in Washington, this chemical will probably be available as a 25% wettable powder and as a 25% emulsion. A 1% concentration (32 lbs. 25% Diazinon in 100 gals. water) averages five week residual, Billings said.

Now available and used in Europe, Diazinon appears to be a good larvicide for flies and mosquitoes, and is said to keep roaches under control about four weeks. Investigations into its use as a space spray have yet to be made.

Three limitations of Diazinon Billings listed are its (1) "relatively higher toxicity than might be desirable," (2) characteristic phosphate group (rotten egg) odor, and (3) high toxicity to birds (chickens, pigeons, etc.). "Much more research needs to be done before we can answer all the questions," Billings explained.

• Clover Mites Again

What are PCOs doing about clover mites? "That's a good question," most experts agree. But operators and suppliers at the KC meeting pooled their ideas and came up with the suggestion Malathion, or Aramite, or Chlorobenzilate, or CPR works in spots.

"No matter what you use," NPCA secretary Ralph Heal advised, "you've got to use 40 gallons of chemical per 1,000 sq. ft. to get clover mite control. That's a lot of chemical and you've got to have the equipment with sufficient capacity, plus a customer that's willing to pay the price." Exterior treatments have to be supplemented with interior applications to get results, the experts say.

• No Resistance Rules

"You're on your own," Heal said. "You'll have to experiment to find out what fly-killers work in your own locality. There is no general rule on resistance of flies to chlorinated hydrocarbons." He did repeat encouragement offered by Malathion and Diazinon. Chlorothion, a product similar in action and toxicity to Malathion, may be another newcomer in 1955, he said. "Don't forget pyrethrum and allethrin. They still kill flies."

• Roaches, Bed Bugs, Fleas, Silverfish - All Resistant

The number of insects no longer knocked-out by once effective pesticides is increasing. Here's the way Dr. Heal reports on this situation.

German roaches resistant to chlordane, lindane and DDT are becoming more wide-spread. Pyrethrum still works, as does sodium fluoride powders, and Ryania powder (good in hidden, dry current-free locations where its light brown fluffy dust is not objectionable). Indoor use of ½ to 1% Malathion in oil solutions, not to exceed 10% of the floor area, is killing resistant roaches.

Bed bugs resistant to DDT are now all over the country and immunity to chlordane is popping

PCO's ADVERTISING SERVICE

NEW

Our ads are fresh and eye-catching.

EXCLUSIVE

This service will be sold to only one firm in each city.

UP TO DATE

New ads plus ideas on other forms of advertising will be furnished monthly.

EASY TO USE

Our mats are ready for use. Merely insert your slogan and name.

ECONOMICAL

Art work, engraving and agency fees are eliminated.

Newspaper mats are 1 column x 4".

clip out!

Mail orders to **Jack R. Levien** Box 130, Richmond 1, Va.

☐ Please start my 1 year's subscription. $90 each city
30 mats, descriptive booklet plus 11 monthly supplements

☐ Please send 1 month's trial package. $10 each city
4 mats and descriptive booklet

please enclose check with order

Name_____

Firm name_____

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A. F. C. QUALITY PRODUCTS FOR PEST CONTROL

Chlordane, oil concentrate, liquid emulsifiable concentrate, wettable powder concentrate, and ready-to-use liquids and powders.

Super Fluorex V, powerful insecticide powder
Sodium Fluoride
Poison Seeds
Pyrethrum and **DDT,** powders and liquids
Paradichlorobenzene

FOR EFFECTIVE RAT CONTROL

Phosphorous Paste
Rumetan (Zinc Phosphide)
Fortified Red Squill Extract and Powder
Antu and **Antu Tracking Powder**
Thallium Sulphate
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Warfarin

FOR TERMITES

Orthodichlorobenzene, Creosote Oil, Sodium Arsenite Powder, Pentachlorophenol Concentrate

Write for particulars and prices

AMERICAN FLUORIDE CORPORATION
223 West 28th Street **New York, N. Y.**

DID YOU LOSE $5

on your last service call?

Earn as much as $5 EXTRA PROFIT on your regular calls with

the new KEYTHOL SCENT CONDITIONER

Wherever people gather or work . . . washrooms, waiting rooms, work areas . . . KEYTHOL chemically neutralizes odors by the principle of dry evaporation and is totally non-injurious. A small, silent motor draws room air over the KEYTHOL chemical block and automatically neutralizes odors . . . quickly, safely!

WRITE FOR INFORMATION AND LOW PRICES OF THE KEYTHOL SCENT CONDITIONER—TODAY!

EXTRA RENTAL INCOME

Pick up steady income by *renting* the KEYTHOL Scent Conditioner. It is the perfect side-line for Pest Control Operators.

EXTRA SERVICING INCOME

***Servicing* the KEYTHOL Scent Conditioner, on your regular service calls, takes a moment. Just change the scent block inside the conditioner.**

ALL YEAR ROUND . . .

You get automatic rental income and repeat sales of scent blocks for only a small investment. Or an *additional handsome profit* when you SELL a KEYTHOL!

Exclusive Sales Representatives of Keythol Products to Pest Control Operators

B&G Company
4725 RISING SUN AVENUE
PHILADELPHIA 20, PENNA.
"Servicing the Pest Control Industry"

up. Lindane at .5% is the recommended answer for everywhere indoors except matresses for which the concentration should be cut to .1%.

Fleas are no longer affected by chlordane, DDT and Dieldrin. Lindane is still working. Malathion is successful and so is Rotenone.

Silverfish are strongly suspected as becoming resistant to DDT, chlordane and lindane. A bait of 6% sodium fluoride and tricalcium phosphate is the one solution Heal gave.

• Sugar Boosts Pivalyn

Acceptance of Pivalyn, liquid formulation of Motomco's anticoagulant rodenticide, is improved by the addition of two heaping tablespoonsful sugar per quart, Billings reported. He also advised Tomorin, another anticoagulant rat killer, is expected to make its debut early this year. Tomorin has cumachlor as its active ingredient and is reported capable of preventing mold in cereal bait formulations.

U. S. Industrial Chemical company's distinguished scientist, Dr. Walter E. Dove, explained the meaning of synergist in pest control. A synergist, he said, is the resultant chemical made up of two agents the total effect of which is greater than the sum of the two effects taken independently. "Practically all synergists work on the exterior physical properties of the insect, but piperonyl butoxide is one which also works inside the insect," he said. Much new study on synergists is being undertaken by U.S.I. according to this company official.

Included in the two-day, interest-packed program chaired by PCO Tom McCloud, Missouri PCA prexy, and Bert Thomas, president of Kansas' termite and pest control association, was a talk by Dr. C. C. Allen, Anderson & Pritchard Co., who gave a commercial talk on his company's insecticide oils. L. S. DeAtley, Thompson-Hayward Chemical company's chief chemist, told delegates how to calculate proper proportions for insecticide formulations.

Epidemiologist for Chicago's board of health, Dr. W. I. Fishbein and Harold Wainess, a sanitation consultant, also from the Windy City, shared that part of the program on pesticide toxicity. Wainess emphasized the need for careful observance of toxicity hazards to avoid possible food contamination by the chemical, but disagreed with officials who absolutely prohibit the use of effective pesticides in food processing establishments, "Now they're getting food contamination by flies they won't let us control with chemicals."

Agreeing with Wainess in part, Dr. Fishbein said he felt present tests on animals are not sufficient to determine the chronic toxicity of insecticides on human beings. The safe-use of modern-day pesticides is good, he said.

Dr. LeGrand Byington, director of health for Kansas City, Kansas and Wyandotte County, explained his city's sanitation program to improve garbage and refuse collection and disposal.

J. W. Fitzpatrick, U. S. Public Health sanitary engineer working with Dr. Byington, briefly explained how their environmental sanitation program is reducing pressures from insects and rodents. He then showed two excellent Communicable Disease Center sound movies, "Biology of Domestic Flies" and "Fly Control and Community Sanitation."

Sinclair Refining's commemorative entomology movie, "500,000 to 1," and Iowa's "Termites" film also were part of the visual education phase of the program.

• Propose Midwest Conference

A twelve-man committee discussed the advisability of having a PCO-university conference to serve the industry in Oklahoma, Iowa, Kansas, Missouri, Colorado and Nebraska. NPCA officials—executive secretry Ralph Heal, regional vice-president Reynold Shuyler, and executive vice-president Arthur Price — joined with elected industry representatives from Iowa — Robert Mansville, state president, John Linn, Ward Combs; Kansas — Bert Thomas, president, Dick Evans, Robert Schendel; and Missouri PCA deledates Tom McCloud, association president, A. J. Danella, and Fred New.

After considering the geographical advantages of state colleges willing to cooperate in this project, PCO members of the committee voted for an annual conference to be held at Kansas State College in Manhattan, Kansas, where Dr. H. Knutson is new entomology chief. There was no representation from Oklahoma at this KC meeting.

Just when the proposed conference will come into realization is unknown, for state short courses now serve this area. A thorough study and preparation will precede the initial Midwest Conference which will probably start in 1956 or 1957.

Session chairmen at this year's pre-spring meeting were PCOs M. L. Buckley and Harlan Shuyler of Kansas City, Mo. Dick Evans was toastmaster at the Friday night bnquet featuring an inspirational sales guidance talk by Arch P. Maulsby of Socony Oil Co. John Loe was in charge of registration.

Representation of city and state health officials, pest control legislation enforcement officers, and key men from leading colleges in the two states at this PCO meeting, attest to the increased favor and acceptance the Kansas and Missouri associations are realizing from their current industry advancement program.

Burmos 1-quart sprayer added to PCE line.

PCE Has English Sprayer

A one-quart portable brass English sprayer, called the Burmos, is now being distributed in this country exclusively by Pest Control Equipment Company. It is recommended for over-the-counter sales to home owners for spot applications in the horticultural field, and to the PCO as a better quality unit for residual applications around the home and on small plantings.

Brass is reported to be the only metal in contact with spray materials in this unit. It will not corrode or deteriorate from insecticidal action. Any nozzles that fit other PCE sprayers are said to also fit the Burmos.

PCE reports it will carry replacement parts for the sprayer and will stand behind the unit performance-wise.

For further information write Pest Control Equipment Company, 47 West 43rd St., New York 36, N. Y.

Sensational NEW KIL-JET FOG GENERATOR

SOME OF THE HUNDREDS OF USES...

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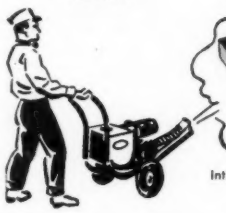

FULLY PORTABLE! Costs Only 10c Per Hour To Operate!

The new Kil-Jet Fog Generator is one of the outstanding contributions to the pest control industry. Since its introduction several years ago, its acceptance by specialists in this field has been phenomenal. Designed for both indoor and outdoor applications . . . engineered by experts in fog generating and pest control . . . built for rugged durability and top performance . . . KIL-JET DOES THE JOB!

This powerful, portable Kil-Jet Fog Generator has application and uses everywhere you look. If you are engaged in the pest control business, Kil-Jet is a MUST for increased profits and more successful pest control operation.

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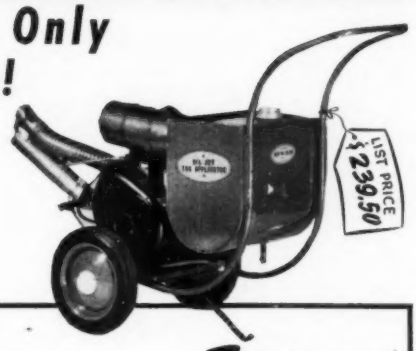

Features

★ **PORTABLE** . . . weighs only 65 pounds . . . Can be carried in the deck of a car.

★ **POWERED** . . . 1½ HP Continental gasoline engine.

★ **ECONOMICAL** . . . spreads a volume of insecticide evenly over a large area at an operating cost of about 10c an hour.

★ **VERSATILE** . . . Equally effective indoors and out . . . is ideal for homes and gardens, factories, warehouses, camps, farms, motels, roadside eating places, dairies, estates, country clubs, mills, etc.

★ **ADAPTABLE** . . . The Kil-Jet Fog Generator effectively uses DDT, Chlordane, Pyrethrum, Lindane, or any type of oil-base insecticide. When you sell Kil-Jet Fog Generator, you make continuous profits on fog oil sales, year in, year out.

★ **ADJUSTABLE** . . . There is a valve for adjusting the fog for wet, dry, or medium.

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organization news

Twenty-two of the delegates to **California PCO Conference** pause for a group picture.

California Operators Adopt Fair Trade Practice Rules

Adoption of fair trade practice rules highlighted the 11th annual Pest Control Operators of California convention held at San Francisco's Sir Francis Drake Hotel, February 22-24.

Some 300 delegates passed the fair trade resolution — instituted to eliminate and prevent unfair business practices so the pest control industry and general public in California will be protected from the harmful effects of certain competitive methods. The agreement also provides guidance and assistance to business for maintaining free and fair competition.

Business practices frowned upon by the California group include misrepresenting prices of industry products, making false or deceptive guarantees or warranties, misusing the word "free," defaming competitive firms, breach of contract, enticing employees away from competing firms, deceptive advertising, false invoices, substituting materials or products other than those agreed upon by the client, fictitious price lists, repudiations of contracts, and selling services below costs.

In addition to the fair trade practice resolution delegates heard talks on termites, food plant sanitation, advertising, and labor relations problems, and traded advice and ideas on their own particular difficulties.

Monday morning's session was kicked-off with a welcoming address by George Christopher, President, San Francisco Board of Supervisors. Highlight of the A.M. session was an address on 1080 rules and regulations by Dr. Allen B. Lemmon, Chief of the Bureau of Chemistry, California State Department of Agriculture.

Monday afternoon PCOs split into two groups for concurrent sessions, one on termite control, and the other on pest control in food processing plants.

Operator Don Athey chaired the seven termite discussions, as delegates heard latest prevention and control information.

Chairman Ed Bushing presided over the sessions dealing with pest control in food processing plants. PCOs learned about sanitation, insect, and rodent problems in bakeries, canneries and dried fruit

(Continued on page 58)

CALENDAR OF MEETINGS

Illinois PCO Conference, University of Illinois, Urbana, April 9-10.

Purdue Insect and Rodent Control Meeting, Purdue University, Lafayette, Ind., April 13-14.

Washington, D.C. Pest Control Assn., Monthly Meeting, Action Pest Control Service, 3054 M Street N.W., Washington, April 19.

New Jersey Pest Control Assn. Monthly Meeting, Entomology Building, Rutgers University, New Brunswick, April 21.

Canadian PCO Conference, Place to be announced, May 10-12.

New England Pest Control Association Suppliers' Night, University Club, Trinity Place, Boston, Mass., May 13.

CSMA Mid-Year Meeting, Hotel Netherlands Plaza, Cincinnati, Ohio, May 23-25.

Florida Pest Control Assn. Convention, Tides Hotel, St. Petersburg, June 11-12.

Florida Pest Control Licensing Examinations, Hillsboro Hotel, Florida & Twiggs St., Tampa, June 14-16.

Alabama Pest Control Licensing Examinations, Birmingham, Decatur, Gadsden, Mobile, Montgomery, Sept. 21.

National Pest Control Association Convention, Miami Beach, Fla., Oct. 17-19.

CSMA 41st Annual Meeting, Hotel New Yorker, New York City, December 5-7.

Group picture taken at the **North Carolina PCO conference,** held at N. C. State in Raleigh, shows (first row L. to R.): Dr. Ralph E. Heal, NPCA executive secretary; L. M. Church, regional director; A. H. Bender, J. R. Byrne. (Standing L to R) Marvin S. Scull, NCPCA secretary-treasurer; A. T. Best, state grievance committee chairman; J. W. Taylor, state director; Walter Wilson, NCPCA president; D. L. Goforth, director; Dr. Clyde F. Smith, head of entomology department, N. C. State; R. T. Gast and G. D. Jones, both of the college faculty. Absent from the picture is Eugene Mabel, NCPCA vice-president.

North Carolina PCOs Meet at Raleigh

A short course was held by the North Carolina Pest Control Association at N.C. State College, February 9 and 10.

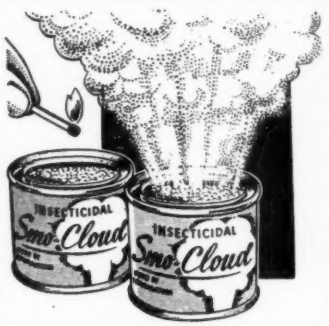
New officers elected at this time are: president, Walter H. Wilson, Wilson Exterminating Co., Winston-Salem; vice-president, Eugene Mabel, Orkin Exterminating Co., Charlotte; secretary-treasurer, Marvin S. Scull, Allied Exterminators, Durham.

Get Your FREE SAMPLE of *SMO-CLOUD!*

"The most effective Insect - Killer put on the market in the last 10 years", Chicago NEWS

SMO-CLOUD destroys nests of both flying and crawling insects. Excellent for one-time jobs as well as regular service work — and as a profitable resale item.

SMO-CLOUD is effective, economical and safeguards YOUR HEALTH! Eliminates the need to expose yourself or your customers to sprays, mists or vapors. Operator leaves the rooms while SMO-CLOUD works. Simply light the contents of can and a white FOG penetrates hard-to-reach crevices and cracks. No flame — no fire hazard. Revolutionary SMO-CLOUD kills: Roaches, Waterbugs, Flies, Silverfish, Ants, Wasps, others. Get your FREE CAN now—you'll never be without it again.



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Rush my free sample of SMO-CLOUD plus literature on how to increase my exterminating profits.

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Complete line of hand, continuous, compressed air, knapsack, bucket, wheelbarrow and barrel sprayers and insecticide dusters. Many styles of spray nozzles. High quality design and performance. SEND FOR CATALOG. "SMITH SPRAYERS are choice for quality the world over."

DDT 4 Gal. COMPRESSED AIR SPRAYER

The finest compressed air sprayer made. High pressure gauge, brass connections, brass valve. For all spraying purposes. Adjustable nozzle. 7 ft. oil proof hose. Automatic shut-off trigger control. Sturdy shoulder strap.

Smith BRONX SPRAYER

Pint-Quart. Brass nickel plated sprayer screws to glass bottle. Easy up and down stroke throws broad, mist spray. Many uses. Excellent "OVER THE COUNTER" item.

Repair parts for all Smith Sprayers readily available.

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★ If you are engaged in the Pest Control, Termite Control, Fumigation or Sanitation business, Phone or write to ARWELL, INC., Waukegan, Illinois, for the opportunity of a lifetime.

ARWELL is prepared to pay you cash if you wish to sell and retire, or,

Pay you cash and hire you as local manager in your area or some other area if you prefer, if you wish to remain in the PCO business.

We will certainly respect your confidence . . . Just write or phone J. D. McNeill, ARWELL, INC., Waukegan, Ill.

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HOPKINS MALATHION

For Fly Control in '54

1953 reports indicate up to 3 weeks residual control when used as sugar bait spray. HOPKINS MALATHION **kills** flies resistant to DDT and other chlorinated hydrocarbons. USDA calls Malathion "One of the safest insecticides to handle!"

HOPKINS MALATHION is also recommended for fly larva control in and around refuse collection areas.

Order a supply TODAY and BE READY for the "Insects of the Year!"

WARFARIN

Redi-Mix Pellets, field tested and proved Warfarin bait. They're ready . . . They're clean, and easy to use. For your own mixing, order HOPKINS .5% Warfarin concentrate.

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Make HOPKINS your source for dependable insecticide formulations.

Hopkins AGRICULTURAL CHEMICAL CO.
740 WILLIAMSON ST., MADISON, WISCONSIN

California PCOs Adopt

(from page 56)

processing plants. The afternoon program concluded with a panel discussion on establishing a sanitation service.

• Phone Book Listings

Tuesday morning's talks centered around three vital topics—standard termite inspection report forms, telephone directory advertising and labor relations problems. In discussing telephone directory advertising, PCOs agreed the word extermination should be stricken from the telephone book and a more suitable heading such as "Pest Control" be substituted, with sub-sections listed under fumigation, household pests, moths, rat control and termites.

Tuesday afternoon was devoted to sightseeing, entertainment, and just plain taking it easy. For the first time in convention history a golf and bowling tournament was held. While would-be Ben Hogans were out on the fairways their opposite numbers were upsetting pins with strikes and spares. Dick Hoag walked away with a trophy for his winning golf game and Lyman P. Pinkston took top bowling honors.

In the evening delegates and their guests took a boat trip over the bay to the Sea Wolfe in Oakland where the president's reception and dinner was held.

Wednesday morning's session was almost entirely devoted to classified advertising. Down-to-earth principles on ideas, shortcuts and costs for this effective advertising medium were discussed.

• Clark Becomes President

Election of new officers took up most of Wednesday afternoon. New prexy for the California group is James F. Clark, Clark Pest Control, Bakersfield. Other 1954 officers are: first vice-president, Herb Packard; and second vice-president, Darrel Cardif.

While husbands were busy with convention business, a full program was offered for the entertainment of operators' wives. Under the direction of Mrs. H. J. Davis, "Lady Bugs" took shopping tours, went sightseeing, and enjoyed San Francisco hospitality.

The 1954 convention came to a successful close with the annual banquet Wednesday evening.

Group of delegates to **'54 Oklahoma PCO Short Course** pose around Omaha operator John Linn's "live termites at work" exhibit. (L to R sitting) PCO Linn, Ken Bell, Amarillo, Texas. (Standing L to R) J. Earl Griffin, Tulsa, past OPCA president; R. E. Kious, NPCA public relations director; E. P. Mace, Tulsa, association vice-president; and Harold Schnorrenberg, Oklahoma City, new OPCA president.

Termite Control Stressed at Oklahoma A. & M. Conference

Termite control problems dominated the highly-lauded fourth annual Oklahoma pest control operators' short course held at Oklahoma A. & M. College, Stillwater, on February 8, 9, and 10.

Over 110 termite and pest control operators attended the meeting jointly sponsored by Oklahome A. & M. and the Oklahoma Pest Control Association.

At this year's convention the Oklahoma PCA established an award to be presented annually to the PCO who contributes unusual and outstanding service to the industry. J. Earl Griffin, Tulsa, retiring OPCA president was honored with the first award.

Such termite subjects as control methods, new chemicals, contracts, inspection reports, excavating, air compressors, and the Oklahoma structural pest control act were hashed-out by operators.

Three exhibits helped PCOs to gain a visual understanding of termite damage. Operator John Linn demonstrated how termites destroy dwellings by showing delegates a model house with live termites at work. Oklahoma City PCO Arthur Shaw, gave instruction for replacing and leveling floor joists, healers, squaring-up door and window frames, and for making other types of termite repairs. Bill Schnorrenberg, Tulsa, added his knowledge to the termite fund, by demonstrating how to replace termite damaged flooring to match old flooring.

Delegates also heard addresses on troublesome topics of insect control in stored grains and food plant sanitation, led by Dr. Richard T. Cotton, USDA authority from Manhattan, Kansas.

R. E. Kious, NPCA Public Relations Director, gave operators public relations tips helpful in pest control work.

New OPCA officers elected at this meeting are: president, Harold Schnorrenberg, Oklahoma City; vice-president, E. P. Mace, Tulsa; secretary-treasurer, J. W. Pinkston, Oklahoma City; director of public relations, J. Earl Griffin, Tulsa; chairman, termite control committee, Andy Ward, Jr., Muskogee.

Truman Heads Ind. PCA

At a recent meeting of the Indiana Pest Control Operators Association, Lee C. Truman, of Indianapolis, was elected president for the coming year.

Other new officers are: vice-president, Dale D. Gause, Muncie; secretary-treasurer, John V. Osmun, Purdue University, Lafayette; directors, Kenneth H. Draper, Indianapolis; Charles O. Partlow, Lafayette; and Robert O. Williams, Evansville.

PEA Talk Carpet Beetles

Professional Exterminators Association, Inc., held a meeting on March 8, at the Hotel Governor Clinton, New York City.

Guest speaker for the evening was PCO Charlie Pomerantz, owner of the Bell Exterminating Company, New York City, who talked on "The Pitfalls of a Carpet Beetle Job."

D. C. PCOs Meet At Action

Regular monthly meetings for Washington, D. C. PCOs will be held on the third Monday in each month at Action Pest Control Service, 3054 M Street N.W., through the courtesy of Ben H. Hayes.

Longer Float for your Insecticides?

PENN-DRAKE®

insecti-sol

- **Deep Penetration**
- **Stain-Free**
- **Completely Volatile**

penn drake products

If your insecticides' killing power can be increased through use of a long-floating base, it will benefit you to consider this highly-purified, practically odorless solvent.

PENNSYLVANIA REFINING COMPANY
BUTLER, PA.
MAKERS OF: WHITE OILS, PETROLATUMS, PETROLEUM SULFONATES, ODORLESS SOLVENTS

NEW IMPROVED HIGH PRESSURE

IDICO STAR

Pistol Type Sprayer

Completely Redesigned For More Comfort in The Hand . . . More Power At Your Fingertips . . . Strengthened and Improved Moving Parts

Never Before So Many Wonderful Features

Light - compact - convenient. Works on self contained pressure. Comes equipped with interchangeable fog spray and pin stream nozzles as well as a swivel directional extension (no tools needed).

One hand operation—no heavy pumping—no dripping—fast improved trigger.

Large opening makes it easy and convenient to fill.

Eliminates wear and tear which means "no breakage".

Holds 1 quart liquid . . Brass bottom container. (Outlasts all other type cans.)

Warranted to give long uninterrupted use and service.

New spray head delivers more liquid in a pin stream of fine fog.

Overall dimensions 10½" high — 9½" long to tip of nozzle. Weight: 1 lbs., 2 oz.

Idico STAR retails for $10.75
Special price to PCO's $ 8.60
16 oz. Idico Jr., also available

We pay postage on orders accompanied by check

IDICO PRODUCTS CO.

3 West 125th Street — New York 27, N. Y.

Senco

SENCO PIVAL CONCENTRATE

An anticoagulant rodenticide. Mix one pound of Senco Pival Concentrate with 19 pounds of corn meal to prepare baits for rats and mice.

5 lbs. $8.75 25 lbs. $41.25
100 lbs. $155.00

Freight prepaid on 50 pounds or more.
2% discount if check is sent with order.

SENCO PHOSPHORUS PASTE

Commonly called rat and roach paste. A specific application for the larger species of roaches. Also an attractive and effective rat poison.

10 lbs. ..... $ 6.00 50 lbs. $19.00
25 lbs. ..... 11.00 100 lbs. 35.00

Shipped freight prepaid in the U.S.A.
2% discount if check is sent with order.

SENCO NEWS. IT'S FREE.

You gotta smile once in a while, and you are sure to smile if you read Senco News.

Information, news, and at least a couple of smiles are yours every month for free.

If you use pest control products, we will be glad to mail Senco News to you.

Please make your request on your company letterhead. Write now and get your copy every month.

SENNEWALD DRUG CO., Inc.

2721 Chouteau Ave. — St. Louis 3, Mo.

ACME . . . the Only Gas Mask with the "Picture Windows"

You never have that "jammed-in" feeling, wearing the ACME Full - Vision Gas Mask. Its patented, larger lenses are like picture windows, giving you full natural vision for that safe, unconfined feeling. When you walk, you can actually see your toes without bobbing your head. This factor alone makes Acme outstanding among gas masks . . . well worth looking into.

Write for the complete story on Acme Gas Masks for the pest control industry.

ACME PROTECTION EQUIPMENT CO.
3037 West Lake Street, Chicago 12, Illinois

PERSONAL BRIEFS

Velsicol's "**Buzz**" **Bussart** stopped us in the hall at the President Hotel in Kansas City to ask if we'd heard about the termite in a bistro who'd stopped his fruitless attempts to gnaw into a cedar bag long enough to shout to his cohort at the other end, "Say, Retic, where's the bartender anyway?" Maybe "Buzz" shouldn't have bothered! . . . See where **R. M. "Bob" Russell** has been upped from assistant to be top man of Orkin's technical department. Congratulations . . . The **Harold Jennings'** in Chicago are back from a vacation trip to Hawaii . . . Missed Tulsa's **J. Earl Griffin** at the Kans-Mo. PCA meeting in Kansas City where plans were being made for a Midwestern PCO Conference, but guess he had to get back to business after a successful state conference at Oklahoma A.&M. where entomology department head, **Dr. D. E. Howell** put on a terrific program . . . Quite a bevy of suppliers were at the KC meeting besides Bussart. There were **Doug Malcolm**, from John Powell, **Ray Perdue** of Virginia Smelting, **Clayton Wright** for B & G, **Bill Eichler** from Prentiss, **E. M. Billings** of Geigy, **Dr. W. E. Dove** from U.S.I., **Dr. C. C. Allen** with Anderson Pritchard, and Thompson-Hayward's **L. S. DeAtley** . . Ragan Pest Control's **John Loe** and **Fred New** manned a tape recorder that took down everything that was said and have promised to send us a complete transcript of this valuable meeting . . . **Reynold Shuyler** and son **Harlan**, who's working on his doctorate at Purdue, were both present as was NPCA executive vice-president **Art Price** from Chicago . . . Harlan tipped us off that **Napesco, Inc.** is soon to come out with a new, low-priced metal bait station . . . PCO **Walter Wilson**, from Winston-Salem, writes enthusiastically about the short course arranged by entomology chief **Dr. Clyde F. Smith** for the boys at North Carolina State College . . . Wonder who had the pest control contract at the hotel where the Texas PCA meeting was held late last year. We just heard "things" were on the move to make delegates feel right at home. Guess they grow 'em mighty big down Texas way . . .

Booklet Tells Thallium Sulfate Benefits Cleverly

American Smelting and Refining Company has issued a unique booklet describing the uses of thallium sulfate as an effective rat control medium. It's cover layout is similar to a death announcement (for rats) with a heavy black border, script type, etc.

Thallium sulfate is a heavy, white crystalline powder, fairly soluble in water. It is odorless, has very little taste, and is reported to be effective in dry bait as well as in water.

Effectiveness of this rodenticide rests largely on the fact that rats who eat it show no early signs of distress to warn other rats away from the bait, the manufacturer claims.

Free copies of this pamphlet are available on request from By-Products Department, American Smelting and Refining Co., 120 Broadway, New York 5, N. Y.

CLASSIFIED ADVERTISEMENTS

When answering ads where box number only is given, please address as follows: Box number, c/o Pest Control, 1900 Euclid Avenue, Cleveland 15, Ohio.

Rates: "Position Wanted" 5c per word, minimum, $1.00. All other classifications, 10c per word, minimum $2.00. All classified ads must be received by Publisher at least three weeks preceding publication date and be accompanied by cash or money order covering full payment.

MANAGERS WANTED

For branch offices. Rapidly expanding pest control firm requires men to manage offices. Must have initiative, sales ability and forcefulness, together with a good education, sound technical and business background. Excellent opportunity to become associated with progressive organization enjoying unusual growth and solid financial position. Salary and percentage plus profit-sharing arrangements enabling earnings in high brackets. All replies strictly confidential. Submit complete data, age, education, experience and all pertinent details, together with photo to: V. J. Caufield, Comptroller, Commonwealth Sanitation Co., 3567 Bigelow Blvd., Pittsburgh 13, Pa.

MANAGERS WANTED

World's largest pest control firm, established in 1901, operating in 26 states, needs several high-caliber men for responsible positions. Must have initiative, good judgment, the ability to work and deal with people, and should be personally ambitious. Experience in professions related to pest control helpful. Liberal salary and incentive arrangements provide excellent opportunities with progressive and well established firm. Employee benefits include paid vacations, sick leave, life insurance, hospitalization and pension plan. Training programs for our future managers and other supervisory positions also open to college graduates. All replies confidential. Contact Technical Department, Orkin Exterminating Company, Inc., 713 W. Peachtree Street, N.E., Atlanta, Georgia.

WANTED

Cash for your exterminating business or accounts located in Chicago, Joliet, Elgin areas. Write Box 331 Pest Control magazine.

WANTED

Want to buy surplus cyanide discoids. Write details to Oser Exterminating Co., 822 14th St., Denver, Colorado.

FOR SALE

One Pest Control Products Hydrex Sprayer. Used one time. In perfect condition. $275. Reason for selling, retiring from business. Box 338 Pest Control magazine.

FOR SALE

1949 Tifa fogger, with or without 1946 jeep. Used very little. Good condition. Also Kil-Jet fogger. Box 340 Pest Control magazine.

FOR SALE

Established termite business in southern Indiana with one truck. Last year business netted over $12,000. If interested write, Hoosier Termite Control, P.O. Box 221, New Albany, Indiana.

FOR SALE

Exterminating service business operating within four boroughs of greater New York. Grossing $6,000 yearly. Box 339 Pest Control magazine.

FOR SALE

Dyna Fog machine, extra equipment. Purchased new summer 1953, used under 40 hours. Excellent condition, must sacrifice. Albert Green, 141 Sprucewood Drive, Levittown, N. Y.

FOR SALE

Well established, Florida location, finest reputation. Business, equipment and trucks. All phases of pest control. Receiving above average in prices for services. Present personnel will stay. Illness forces sale. Box 337 Pest Control magazine.

FOR SALE

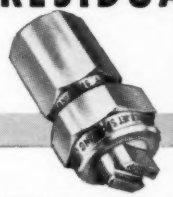
Well established pest and termite control business, in fast growing Houston, Texas. Priced under $20,000. Box 330 Pest Control magazine.

BUSINESS OPPORTUNITY

Are you ambitious? Want your own pest control business? If you are capable, can secure volume business and possess proper experience for managing a business—we will furnish all equipment plus all financing to put you in business for yourself — on a lucrative profit-sharing arrangement. Unusual opportunity for honest, aggressive men. Write all about yourself in strictest confidence to Mr. V. J. Caufield, Comptroller, Commonwealth Sanitation Co., 3567 Bigelow Blvd., Pittsburgh 13, Pa.

Distribution *makes* the Difference in...

RESIDUAL SPRAYING



SPRAYING SYSTEMS TeeJet SPRAY NOZZLES

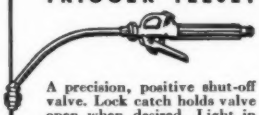
Distribution of liquid particles are very important in residual spraying. TeeJet Spray Nozzles give you uniform distribution over entire pattern area . . . and proper atomization. Available in any capacity, nozzle assembly includes interchangeable orifice tip and strainer. Write for Bulletin 58.

FOR EASIER SPRAYING ON THE JOB

ADJUSTABLE CONEJET

With ½ turn of tip you have full range choice of spray from finely atomized cone to solid stream. Fits any TeeJet body or Trigger TeeJet. Write for Bulletin No. 63.

TRIGGER TEEJET



A precision, positive shut-off valve. Lock catch holds valve open when desired. Light in weight, comfortable. Supplied with straight or curved extensions. Use with any TeeJet Tip. Write for Data Sheet 4675.

SPRAYING SYSTEMS CO.
Engineers and Manufacturers
3221 RANDOLPH STREET • BELLWOOD, ILLINOIS

Consultant

on the Control of Termites, Wood-Boring Insects and Wood Preservation

(1) Advice on Job $50.00 per day and expenses. ¼ day minimum.
(2) Agent to Consult Government Departments, Daily rate.
(3) Advice by Letter or Telephone $10.00 each, unless much Research Required, then Daily rate.

Dr. Thomas E. Snyder
2801 Adams Mill Road, N.W. Washington 9, D. C.
Telephone: DUpont 7-3757

Friar M. Thompson, Jr.

ATHENS, GEORGIA

Consultant specializing in insecticides, rodenticides, fungicides, weed controllers for industry, household and farm.

Product formulation, testing, labeling.

THERE IS NO GAMBLE . .

When You Use

PER-MO MOTHPROOF LIQUID

A Tried and Proven Product

FOR THE PAST 19 YEARS

GIVE YOUR CUSTOMERS A WRITTEN

5-YEAR MOTH GUARANTEE

Other outstanding features include . . .
- Will not spot or stain
- Completely Odorless
- Non-Combustible
- Completely Harmless
- Thousands of Satisfied Users

WRITE TODAY FOR FULL DETAILS!

Other Per-Mo Products . . .
* Flameproof Liquid
* Warfarin for Rats and Mice
* Rat and Mice Liquid
* Red Squill Rat Baits
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* Antu Rat Paste
* "Chek" Deodorant

All Products shipped in bulk or packaged for resale.

WE WILL SHIP YOU A GENEROUS SAMPLE OF ALL THE ABOVE PRODUCTS FOR $5.00 EXPRESS PREPAID

Send Check or Money Order

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PER-MO PRODUCTS COMPANY
3602-04 Woodland, Kansas City 3, Mo.

MICE-GLUE

GETS MICE LIKE FLYPAPER GETS FLIES

7½ lbs. $1.00 per lb. 25 lbs. $.90 per lb.
100 lbs. $.80 per lb.

BIRD-REPELLENT

Keep Pigeons, Starlings and Other Birds from Buildings

7½ lbs. $1.00 per lb. 25 lbs., $.90 per lb.
100 lbs., $.80 per lb.

PEST CONTROL CHEMICALS CO.
324 Broadway Write for details Buffalo, N. Y.

Pesticide Formulations

We will make on order in any concentrate formulations of the following:

DDT, BHC, TOXAPHENE, ALDRIN, DIELDRIN, HEPTACHLOR, CHLORDANE, LINDANE, MALATHION
2,4-D, 2,4,5-T, MCP, CHLORO-IPC

Rock Botton Prices !

Box 317
PEST CONTROL MAGAZINE

pestales

Man of War a la Cockroach

Some people just don't seem to care how they lose their money.

Wealthy Egyptians are reported crazy about cockroach racing. Meets are held weekly on a secluded hotel veranda with minimum bets running $3.

The two inch "speedsters" have their backs dabbed with different colors and have names like "Tiger," "Prince," and "Panther." Starting boxes are upturned tumblers. First insect to reach a red ribbon eight yards away is winner.

Wonder if the Egyptians ever heard of poker?

* * *

SNAFU

It's still the same old Army.

In San Antonio, Tex., a sanitation laboratory at Fourth Army headquarters was closed down for several days during maneuvers.

When soldiers returned and reopened the lab, they found rats had chewed up several Army field manuals — including one entitled *Control of Rodents.*

Rats must not have liked what they saw in print.

* * * *

What's in a Name?

Maybe Joseph Kopcho, of Pottstown, Pa., should get a cat.

He recently found several pounds of dog food in an old organ in his home, evidently stored there by a rat who had been raiding his dog's plate at mealtime.

The dog, named *Terror*, is a rat terrier.

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Garbage and Flies

(from page 22)

less attractiveness to flies and helps prevent seepage into the bottom of the can. Make sure that customers don't use heavy oil drums, insanitary bins, or open or nonwatertight containers for garbage storage.

Twice-weekly collections of garbage are a vital part of effective fly control, the CDC says. During hot summer months the time required for development of flies from eggs to mature larvae is frequently less than seven days, hence one garbage removal a week is not enough.

When garbage is collected, it should be put into collection trucks without spillage, and transported to the disposal site in covered, leakproof vehicles.

If wet garbage is unloaded on open dumps within flight range of populated areas, fly headaches are sure to follow. Two ways to properly dispose of wet garbage are through complete community incineration or by using sanitary land fills, the CDC recommends. Either method helps eliminate fly breeding. Choice between them depends upon availability of land and of sufficient money.

REPEAT SALES build steady PROFITS!

AER-O-MATIC DOOR TYPE DEODORIZER

Create new sales and build steady refill repeat profits with this low priced, highly profitable automatic door type deodorizer. Perfumes and cleans the air every time the rest room door is opened or shut. Easily installed for long, satisfactory service. No electricity—no wires. Simply but sturdily constructed. 100% pure Paradichlorobenzine cartridges changed every 30 days.

WRITE FOR FREE LITERATURE

AER-O-MATIC ELECTRIC DEODORIZER

Cleans and refreshes the air silently, steadily twenty four hours each day. Scientifically developed neutralizing agent reaches every corner of the rest room.

AER-O-MATIC Trade-Mark Reg. Products

ALLIED BLOCK CHEMICAL COMPANY

429 Bingham Street • Pittsburgh 3, Pa.

A Key Insecticide to Pest Control Operations ...that's PYRENONE*

Charles D. Cushing, Vogel-Ritt Inc., Philadelphia says "Safety and Versatility of Pyrenone Give It Preferred Position in Many Applications"

"There are many pest control problems for which there are several alternative methods and products with nearly equal effectiveness. But we have found there are some jobs where Pyrenone is the only safe insecticide to use, others where it is the most effective to use and many times when it is the most convenient to use," says Mr. Cushing.

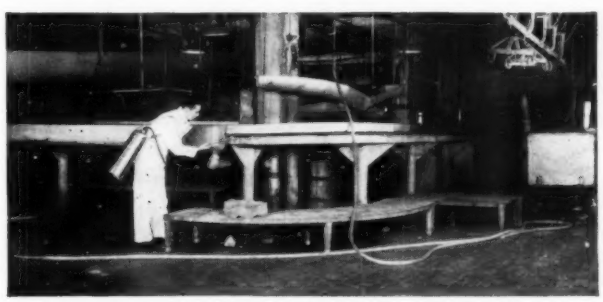
To this organization, Pyrenone provides potent ammunition for their never-ceasing battle against the insects.

"One of our greatest uses for Pyrenone is as an activator to give quick knockdown for most of the residual sprays we use," Mr. Cushing reports. "And there are many special jobs on which Pyrenone products are ideal – on repossessed furniture, in food processing plants and bakeries of all kinds, and in restaurants, bars and hotels."

Strict compliance with U. S. Food & Drug Administration specifications on insecticide usage is a cardinal principle of Vogel-Ritt service, and Pyrenone makes possible an effective control program well within these limitations. With a small inventory of basic Pyrenone products, it is easy to dilute, emulsify or combine a specially made formulation best suited to the method of application and with the necessary potency for the job.

Are you making the most of Pyrenone on your pest control problems? Get the story on Pyrenone from the U.S.I. branch office nearest you.

Charles D. Cushing, Manager of Vogel-Ritt Inc., Philadelphia, checks assignments with George Pelosi, one of the staff of 35 operators serving Vogel-Ritt customers in Philadelphia and vicinity.



Insect prevention is an important part of the sanitation program of the Consolidated Dressed Beef Company in Philadelphia. Insecticides must provide quick knockdown, high kill to insects, with little or no toxicity hazard to man and warm-blooded animals. Pyrenone meets these requirements.

Pyrenone*

*Reg. U.S. Pat. Off., U.S.I.

Ready, willing and able to cope with Philadelphians' pest control problems, the typical Vogel-Ritt serviceman is equipped with the best tools and chemicals to do his job—in many cases products based on Pyrenone.

U.S.I. INDUSTRIAL CHEMICALS CO.

Division of National Distillers Products Corporation

120 Broadway, New York 5, N. Y. ***Branches in Principal Cities.***

In Canada: Natural Products Corporation, Toronto and Montreal

PCE

Your Best Sprayer Buy!

CUT COST! SAVE TIME!

$28.00

STAINLESS STEEL TANK TYPE SPRAYER

A 3 gallon stainless steel unit that is built for service! Economical and efficient in operation. CHECK THESE FEATURES: All mechanical seals — no soldered inlets — leakproof valve gauge with unbreakable crystal — stainless steel 3 gal. tank and pump by Hudson. Renewable hose end adapters — 5 ft. PCE oil-resistant hose ¼" I.D. — 18" PCE extension wand — fan pattern spray nozzle — Knapsack type web strap.

BURMOS 1 QT. SPRAYER

The finest 1 qt. job we've ever seen. Hollow tip Spraying Systems TeeJet ⅛" F. nozzle, interchangeable with any nozzle furnished on P C E sprayers. Withstands corrosive action of water-based insecticides.

ALL BRASS
$9.95 Each

ACCESSORIES FOR LIQUID INSECTICIDE SPRAYERS

Strainer With Monel Metal Screen

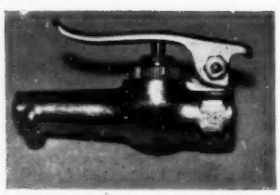
Bouy

Cap

Interchangeable Orifice Tip

PCE is factory distributor for Spraying Systems Co. specialized nozzles for the PCO — at new low factory established prices. Write for prices.

VALVES



Standard on all PCE equipment, but will make any equipment better. Provides clean, quick on-off operation. Drop forged brass. Special internal parts to withstand the chemical action of the materials used by the PCO. For long, trouble-free service and low maintenance cost, use this superior valve.

Shut-off	**$2.75**
Quick-opening	**$9.70**

2 QT. RESIDUAL APPLICATOR

$27.00

Here's a lot of sprayer for the money. Chrome finished all brass tank. Easy to clean. Professional in appearance. Has top-mounted easy-to-read pressure gauge with unbreakable crystal. Easy top fill. Check valve prevents dripping or accidental discharge when extension is removed. No soldered inlets. ALL MECHHANICAL SEALS WITH OIL AND CHEMICAL RESISTANT RINGS. Can be operated with one hand.

All Prices F.O.B. New York
All Prices Subject to Change Without Notice
Write for Catalog

PEST CONTROL EQUIPMENT COMPANY

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